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General Technical
Report WO-60

Timber Volume Distribution Maps for the Eastern United States

Fifty-two Maps Showing Cubic-foot Volumes and Board-foot Volumes for Major Timber Species

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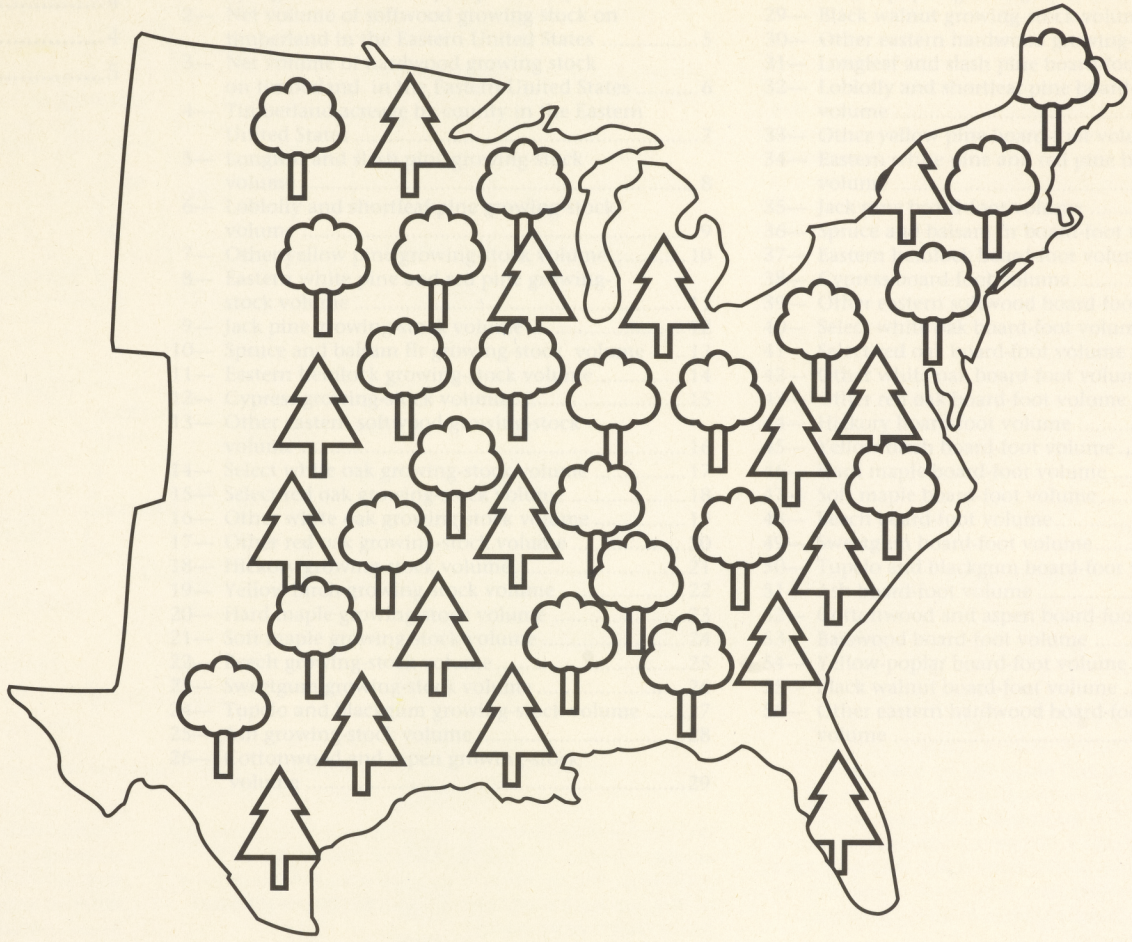
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Forest Service

January 1992

Timber Volume Distribution Maps for the Eastern United States



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Acknowledgments
The authors thank Joanne Faulkner, Southern Forest Experiment Station; Thomas Frieswyk, Northeastern Forest Experiment Station; and William B. Smith, North Central Forest Experiment Station, who prepared the data bases, and Larry Royer, Southeastern Forest Experiment Station, who prepared the SE data base and all the maps for this project.

Timber Volume Distribution Maps for the Eastern United States

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Timber Volume Distribution Maps for the Eastern United States

Abstract

Maps show the distribution of growing stock and sawtimber volume for the 26 most important timber species and species groups in the Eastern United States. Volumes per acre of timberland are depicted by county. The maps should be particularly helpful to wood users who are trying to determine where volumes of important species are concentrated.

Introduction

This report presents maps that show the distribution of growing stock and sawtimber volumes for the 26 most important timber species and species groups in the Eastern United States. The maps were prepared through the joint efforts of the Forest Inventory and Analysis (FIA) Units at the four USDA Forest Service Experiment Stations in the East—the Southern (SO), the Southeastern (SE), the Northeastern (NE), and the North Central (NC) Forest Experiment Stations.

The maps represent a new and somewhat experimental method for presenting the results of statewide forest inventories. The purpose of any timber inventory is to describe the trees on some area in terms that are meaningful to potential users. Over the last 50 years, FIA Units have released hundreds of reports that provided updated timber information for States or portions of States. As in the present report, the key units of measure were cubic feet for growing stock and board feet for sawtimber because these units are meaningful to timber growers, sellers, and buyers. The information, however, was presented primarily in tables. For some purposes, we believe that maps can be more useful than tables. And geographic information systems that have been made available to us make it possible to prepare timber volume distribution maps at a reasonable cost.

In preparing this report, which required major contributions from four separate FIA Units, major decisions had to be made about numbers of maps, species, and species groups to feature, and methods of presentation. We chose to present volumes per acre of timberland in individual counties. We could, instead, have mapped on the basis of total volumes in counties. We chose to do the former to account for wide differences in the amounts of timberland among counties. We believe that our decisions were reasonable, but we invite comments about the usefulness of this publication and about revisions that might make future efforts more useful.



Figure 1 – **Delineation of the Eastern United States by regions of inventory responsibility.**

The Data

The data upon which maps are based were gathered in forest inventories of individual States. The information about each State represents forest conditions at the time of the most recent inventory—between 1972 and 1989. No attempt was made to project data to a common point in time.

Regions differ in forest conditions and in demands for information about timber. Sampling techniques, therefore, vary somewhat among FIA Units representing different regions. All FIA plots are designed to measure forest conditions on 1-acre sample areas, but the methods for selecting trees for measurement on that acre are not consistent throughout the Eastern United States. Various arrangements of fixed- and variable-radius plots are used to meet specific objectives. Figure 1 shows the States that each of the four FIA Units is responsible for. Detailed information on sampling schemes, distribution of sampling areas, and methods of computation can be obtained by writing to the individual FIA Units

Definitions

Timberland is defined as land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, not currently developed for nonforest use, capable of producing 20 cubic feet of industrial wood per acre per year, and not withdrawn from timber utilization by legislative action.

Growing-stock volume is the estimated volume of sound wood in the main stems of living, sound, well-formed trees. It is expressed in cubic feet. It includes only the volume in trees 5.0 inches in diameter at breast height (d.b.h.) or larger from a 1-foot stump to a 4.0-inch minimum top diameter outside bark of the central stem or to where the central stem breaks into limbs.

Sawtimber volume is the net board-foot volume in the central stem of trees of sawtimber size —9.0 inches d.b.h. for softwoods and 11.0 inches d.b.h. for hardwoods. Volume is estimated from a 1-foot stump to a minimum top diameter outside bark of 7.0 inches for softwoods and 9.0 inches for hardwoods or to where the central stem breaks into limbs.

Across the East, FIA fieldworkers record the individual species of measured trees of important species. In this report, however, it has been necessary to group species to have a reasonable number of maps for presentation. Species groups designated in this report are:

Longleaf and Slash Pine—includes longleaf and slash pine.

Loblolly and Shortleaf Pine—includes loblolly and shortleaf pine.

Other Yellow Pines—includes sand pine, spruce pine, table mountain pine, pitch pine, pond pine, scotch pine, and Virginia pine.

Eastern White Pine and Red Pine—includes eastern white pine and red pine.

Spruce and Balsam Fir—includes balsam fir, white spruce, black spruce, and red spruce.

Eastern Hemlock—includes eastern hemlock and Carolina hemlock.

Cypress—includes baldcypress and pondcypress.

Other Eastern Softwoods—includes Atlantic white cedar, Frazier fir, Rocky Mountain juniper, southern redcedar, eastern redcedar, larch, tamarack, Norway spruce, Engelmann spruce, blue spruce, ponderosa pine, Austrian pine, Douglas-fir, and northern white cedar.

Select White Oaks—includes white oak, swamp white oak, Durand oak, bur oak, swamp chestnut oak, and chinkapin oak.

Select Red Oaks—includes cherrybark oak, northern red oak, and Shumard oak.

Other White Oaks—includes overcup oak, chestnut oak, post oak, Delta post oak, and live oak.

Other Red Oaks—includes black oak, willow oak, pin oak, nuttall oak, water oak, shingle oak, southern red oak, northern pin oak, scarlet oak, and laurel oak.

Hickory—includes water hickory, butternut hickory, pignut hickory, pecan, shellbark hickory, shagbark hickory, black hickory, and mockernut hickory.

Hard Maple—includes Florida maple, black maple, and sugar maple.

Soft Maple—includes red and silver maple.

Tupelo and Blackgum—includes water tupelo, blackgum, and swamp tupelo.

Ash—includes white ash, black ash, green ash, pumpkin ash, and blue ash.

Cottonwood and Aspen—includes balsam poplar, eastern cottonwood, big tooth aspen, swamp cottonwood, plains cottonwood, quaking aspen, and silver poplar.

Basswood—includes American and white basswood.

Other Eastern Hardwoods—includes all other hardwoods not previously listed.

Map Interpretation

For some purposes, users may wish to rank the relative importance of species or species groups across the Eastern United States. Figures 2 and 3 show the total growing-stock volumes for softwood and hardwood species groups. The volume in each county is highly dependent upon the timberland acreage within the county as well as the concentration of material on these acres. In interpreting reported volumes, reference should be made to figure 4, which shows the timberland area by county.

For each county, volumes per acre were determined by taking the average volume per acre of a species or species group found on survey plots and dividing it by the total timberland acreage in the county. The intervals shown in the legend of each map were determined for the species or species group by a computer program. Intervals were selected to provide a full range of symbols for each species presented. The dotted counties in western Texas and Oklahoma were excluded from the inventories because of insignificant forestland area.

Figure 2 – **Net volume of softwood growing stock on timberland in the Eastern United States.**

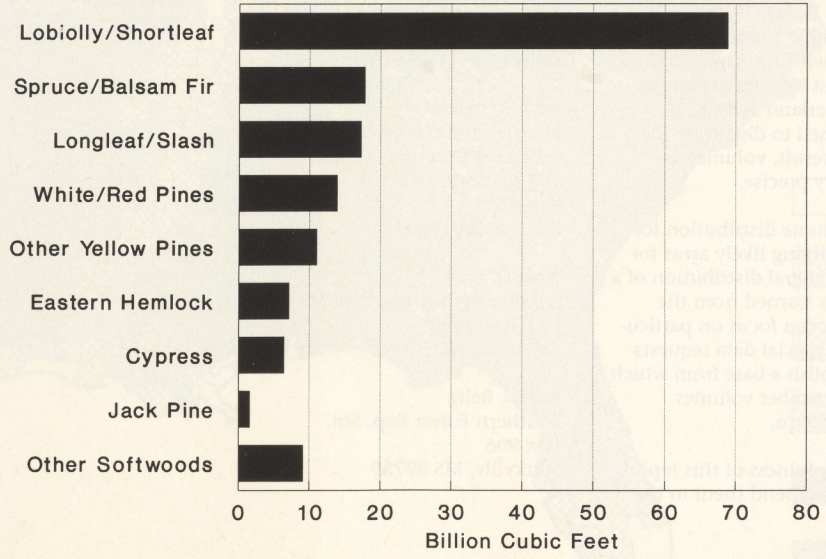
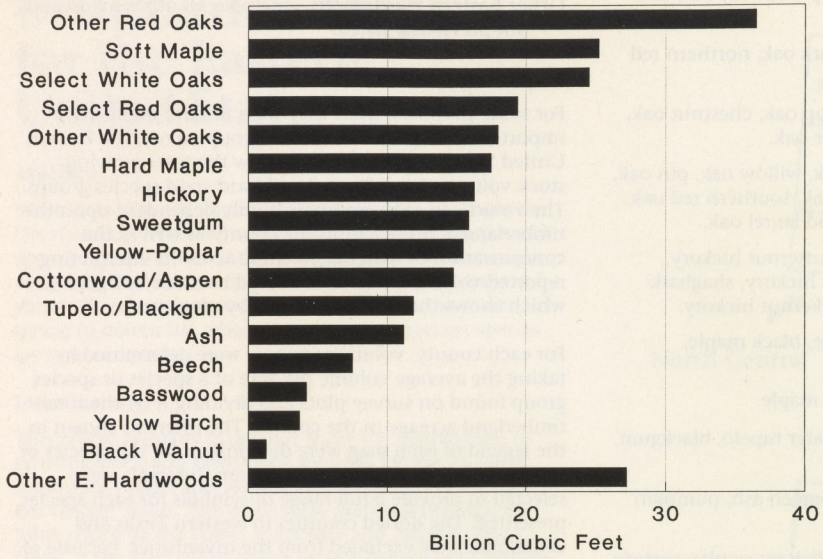


Figure 3 – **Net volume of hardwood growing stock on timberland in the Eastern United States.**



The maps are intended to show species occurrence and volume distributions in a general way. Volume per acre estimates by county, however, may suggest a precision that does not exist. For example, in Kansas, "other red oak" and "other white oak" maps show a block of counties in the eastern part of the State with the same volume per acre. Since there are so few forest inventory plots in these counties, due to the low timberland acreage, a stratum weighting procedure was used to distribute the volume across these counties. As a result, volumes assigned to these counties are not very precise.

The maps are intended to assess volume distribution for broad-scale decisions, such as identifying likely areas for new wood-using plants. Once the general distribution of a particular species or species group is learned from the maps, a more detailed investigation can focus on particular areas using published reports of special data requests from each FIA Unit. The maps establish a base from which to measure future gains or losses in timber volumes among the 26 species and species groups.

If you have comments about the usefulness of this report or suggestions for improving it, please send them to the FIA Unit in your area (fig. 1).

The addresses are:

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Noel D. Cost
Southeastern Forest Exp. Stn.
P.O. Box 2680
Asheville, NC 28802

Roy C. Beltz
Southern Forest Exp. Stn.
Box 906
Starkville, MS 39759

Figure 4 – **Timberland acreage by county in the Eastern United States.**

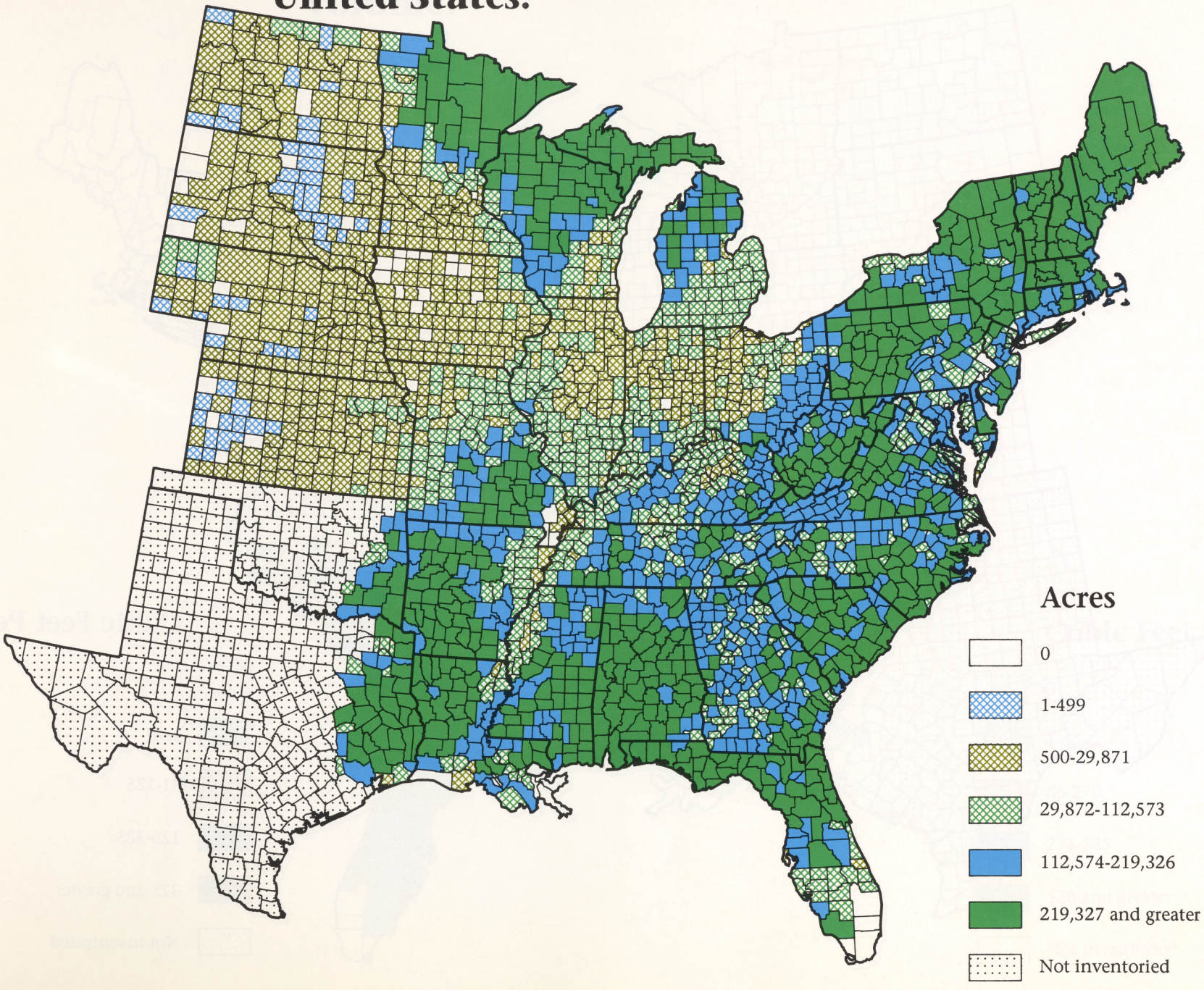


Figure 5 – **Longleaf and slash pine growing-stock volume.**

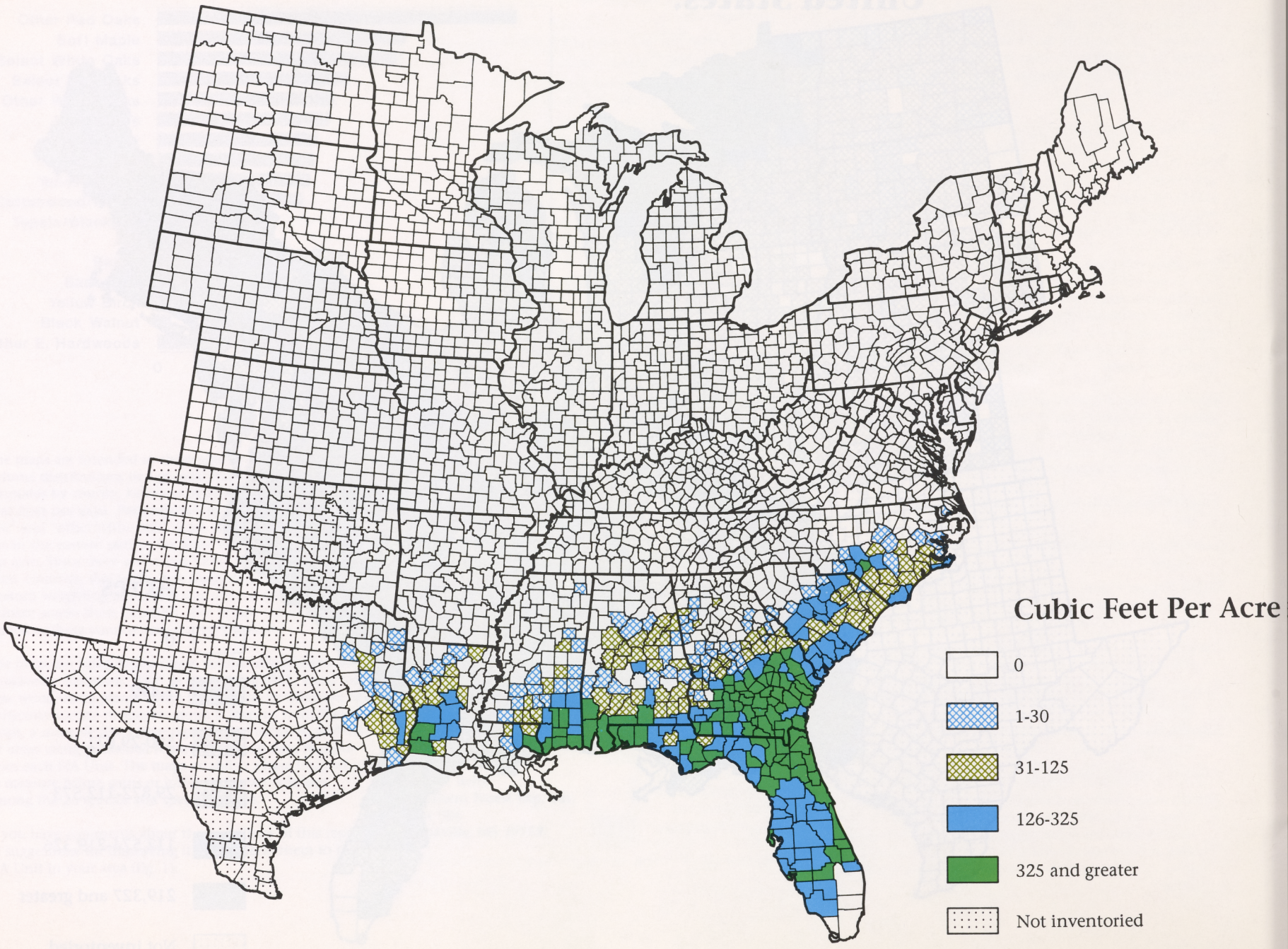


Figure 6 – **Loblolly and shortleaf pine growing-stock volume.**

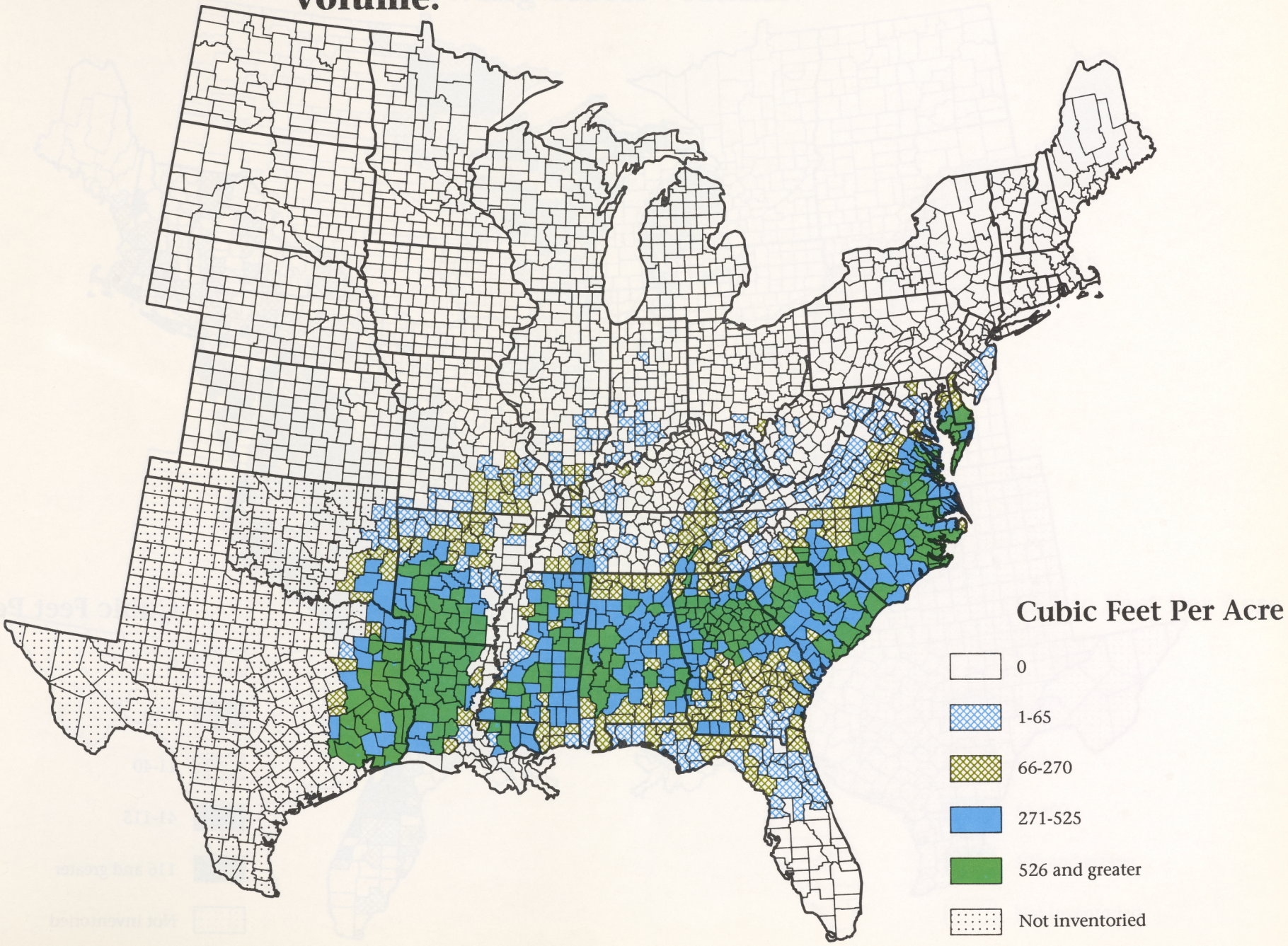


Figure 7 – **Other yellow pine growing-stock volume.**

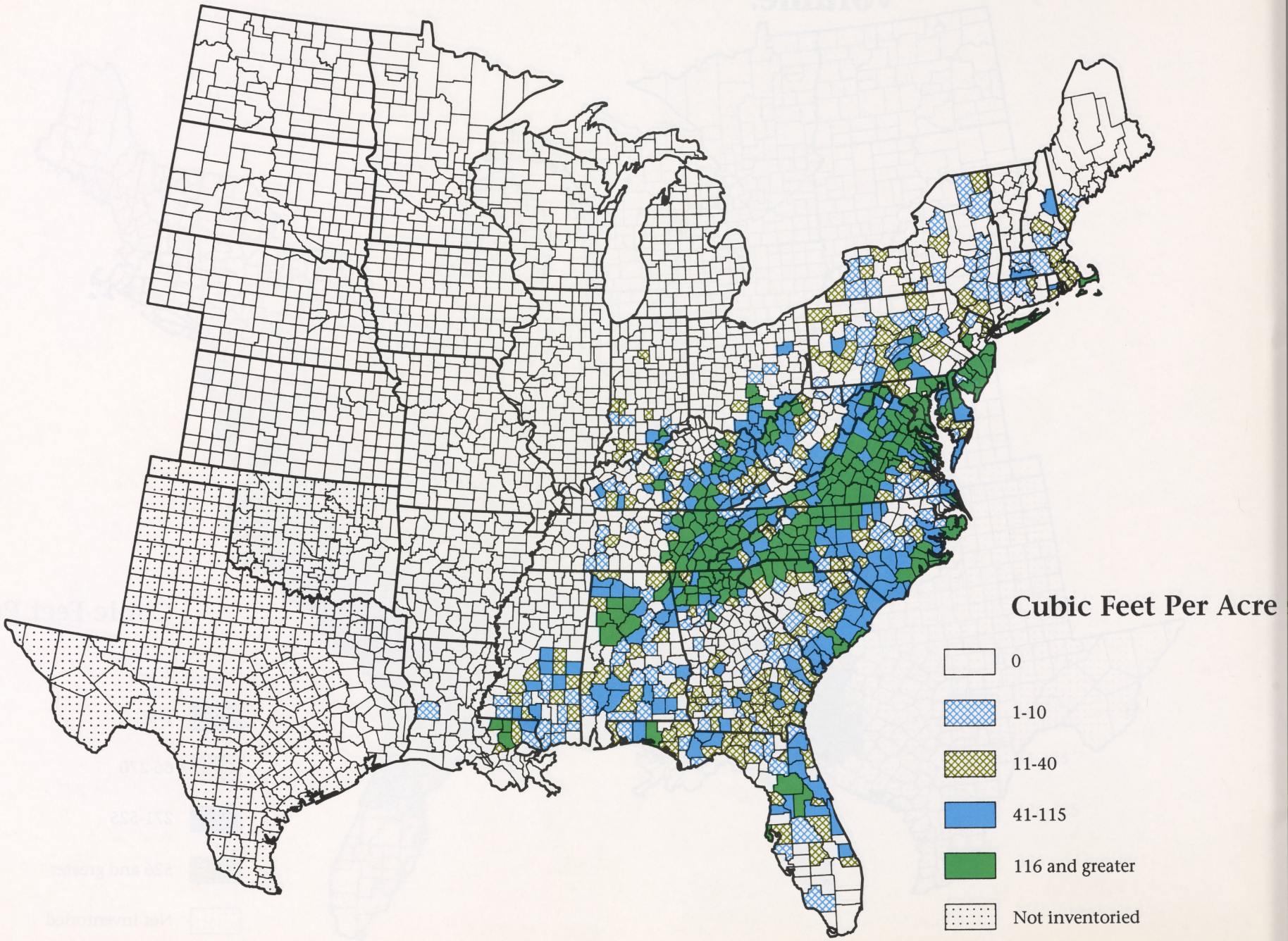


Figure 8 – **Eastern white pine and red pine growing-stock volume.**

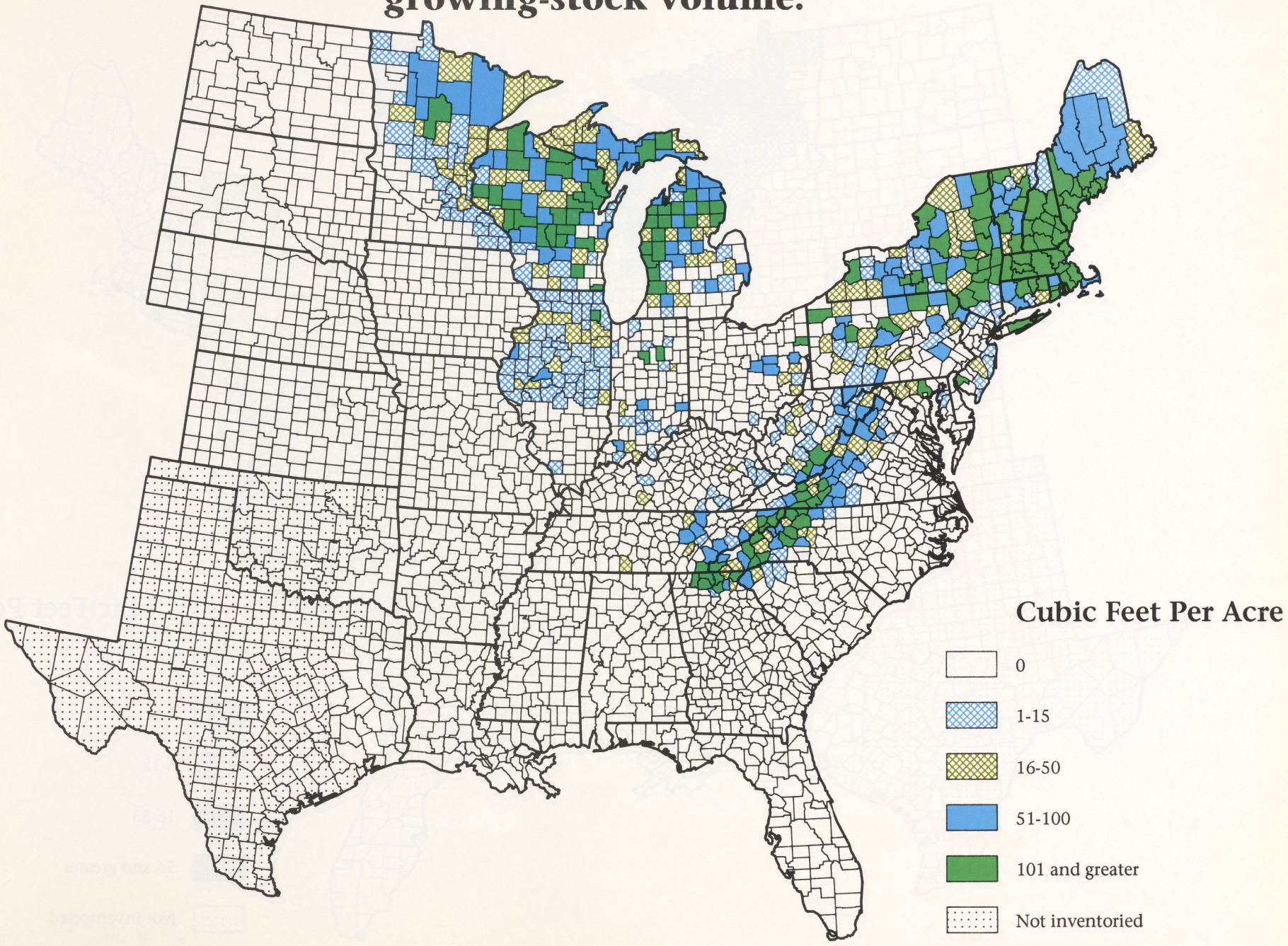


Figure 9 – **Jack pine growing-stock volume.**

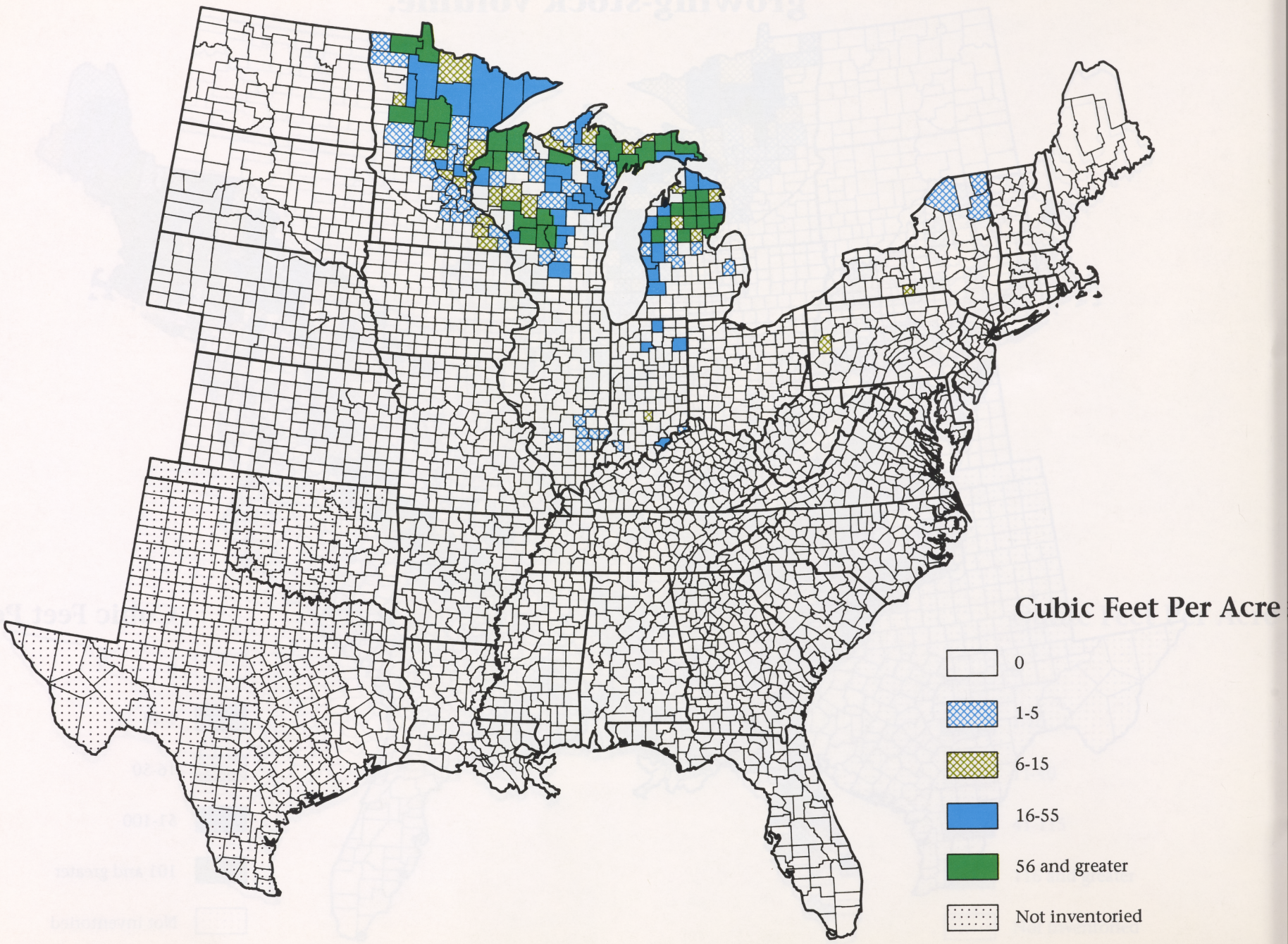


Figure 10 – **Spruce and balsam fir growing-stock volume.**

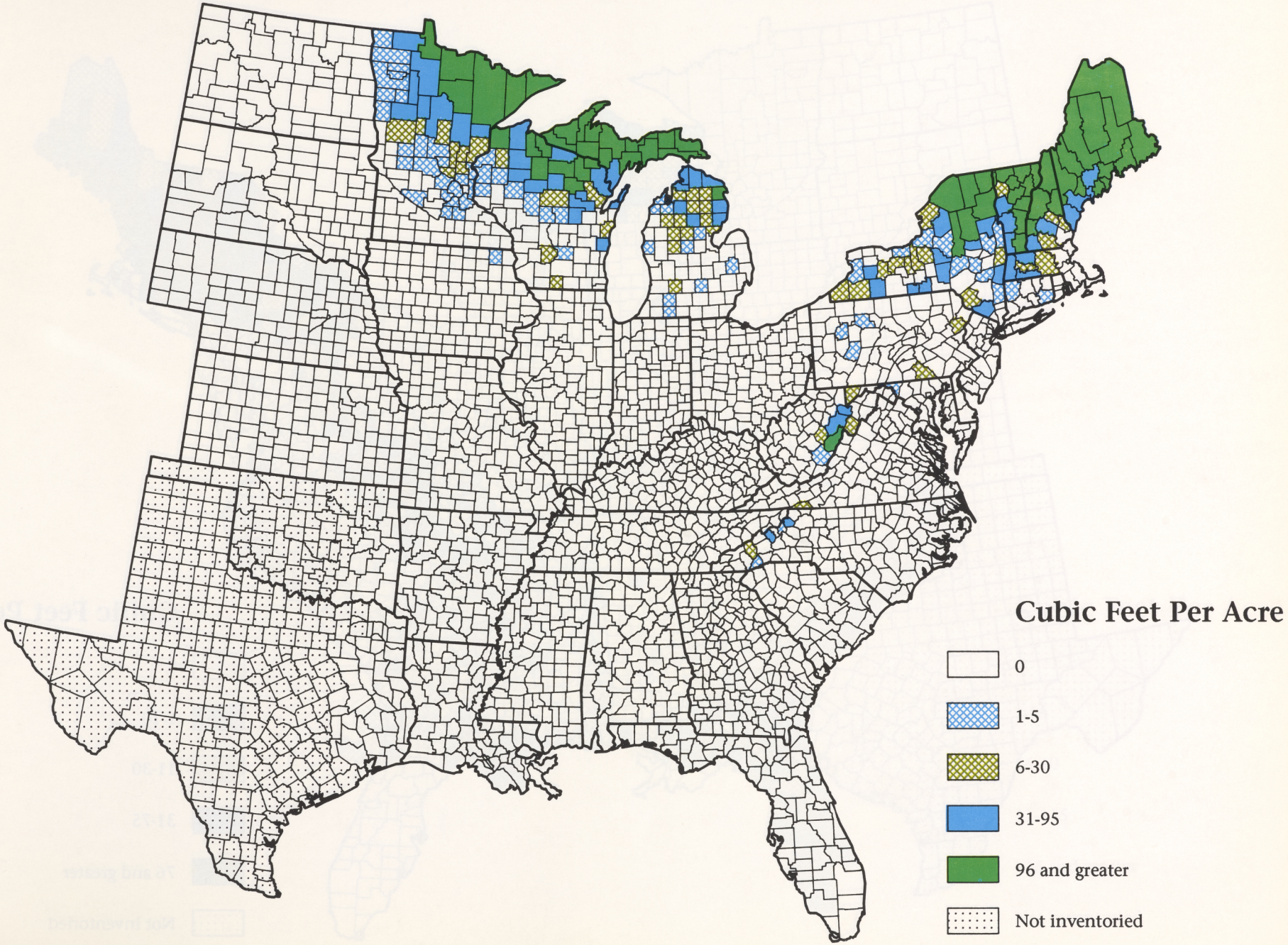


Figure 11 – **Eastern hemlock growing-stock volume.**

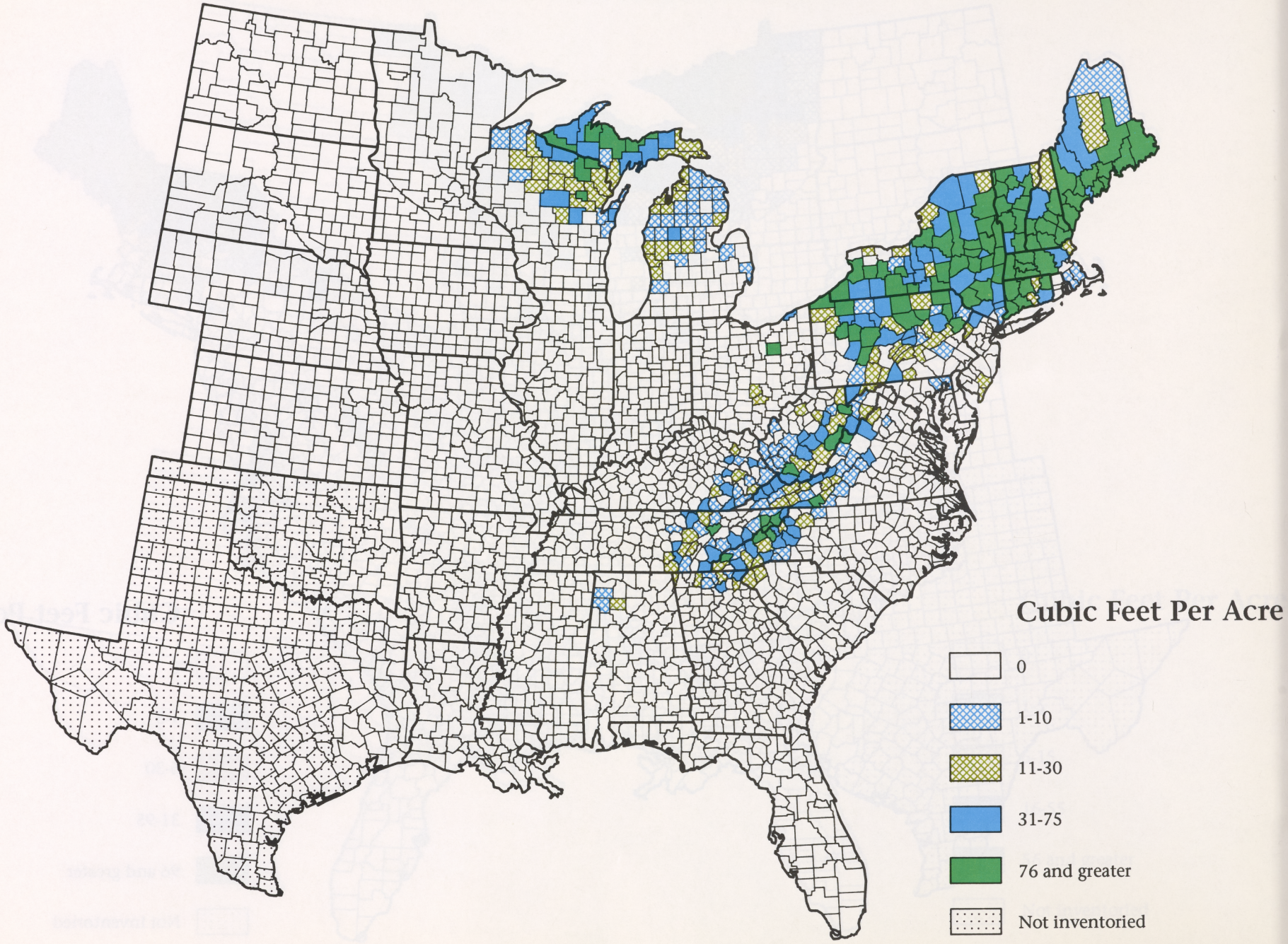


Figure 12 – **Cypress growing-stock volume.**

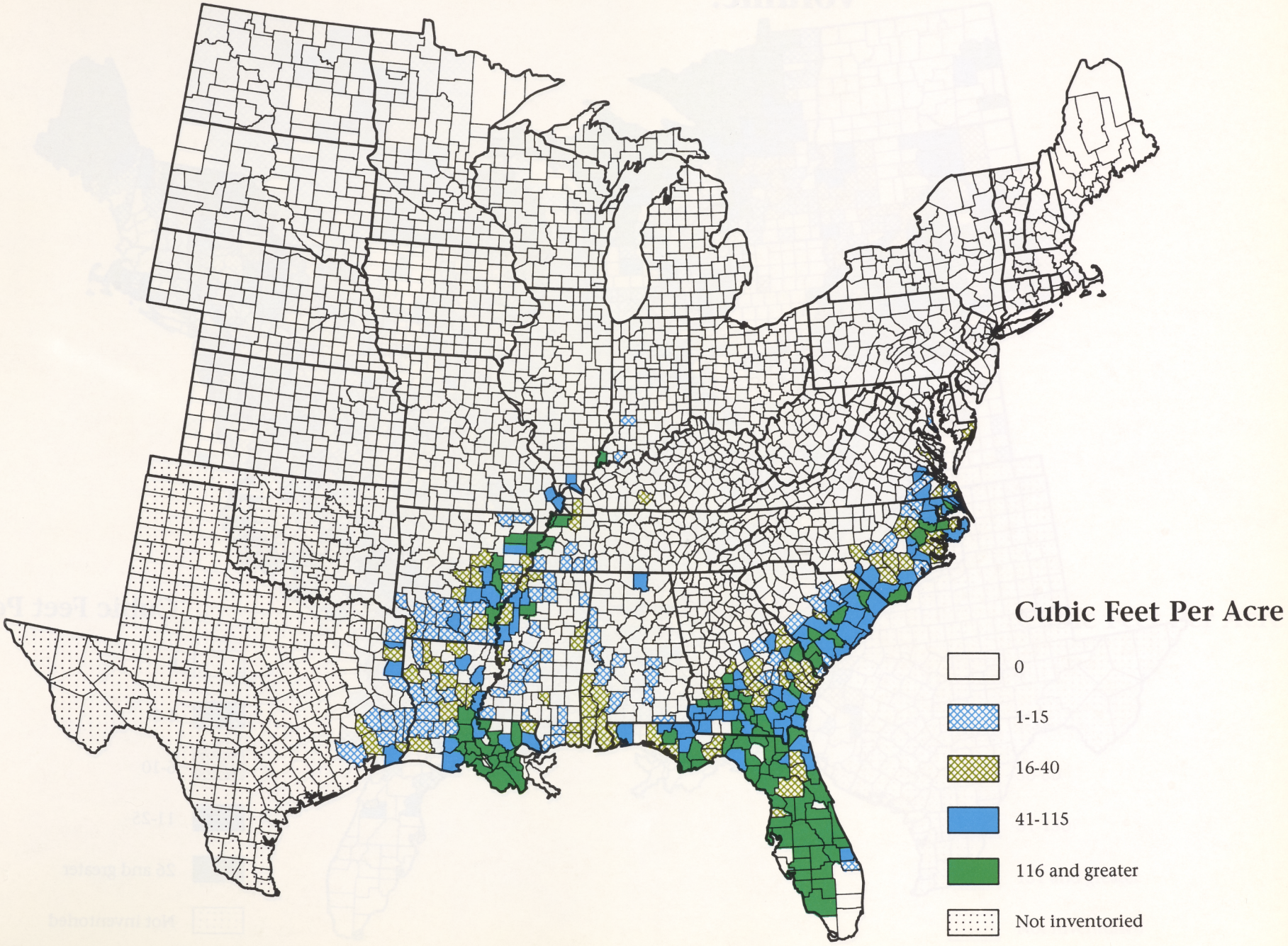


Figure 13 – **Other eastern softwood growing-stock volume.**

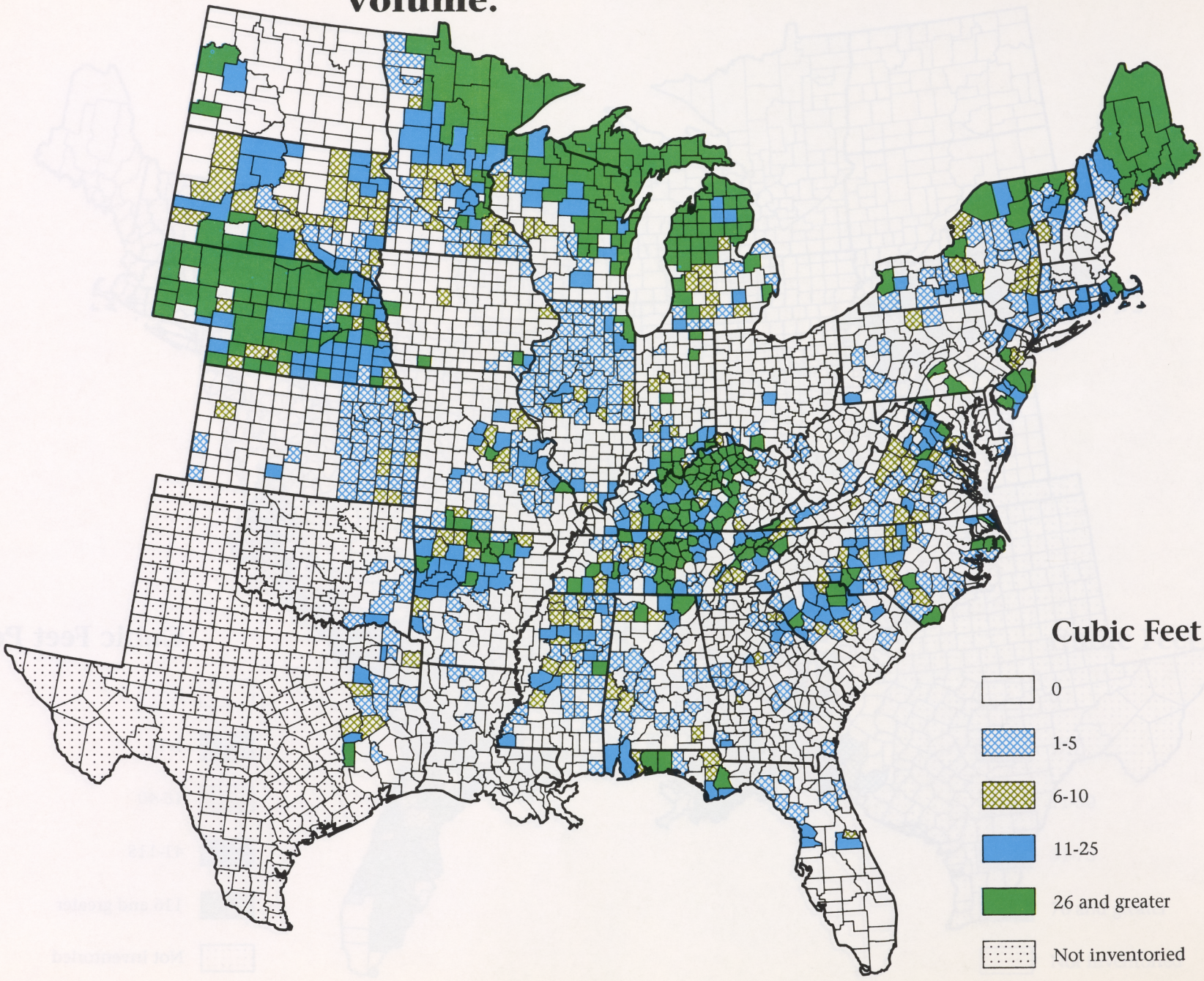


Figure 14 – **Select white oak growing-stock volume.**

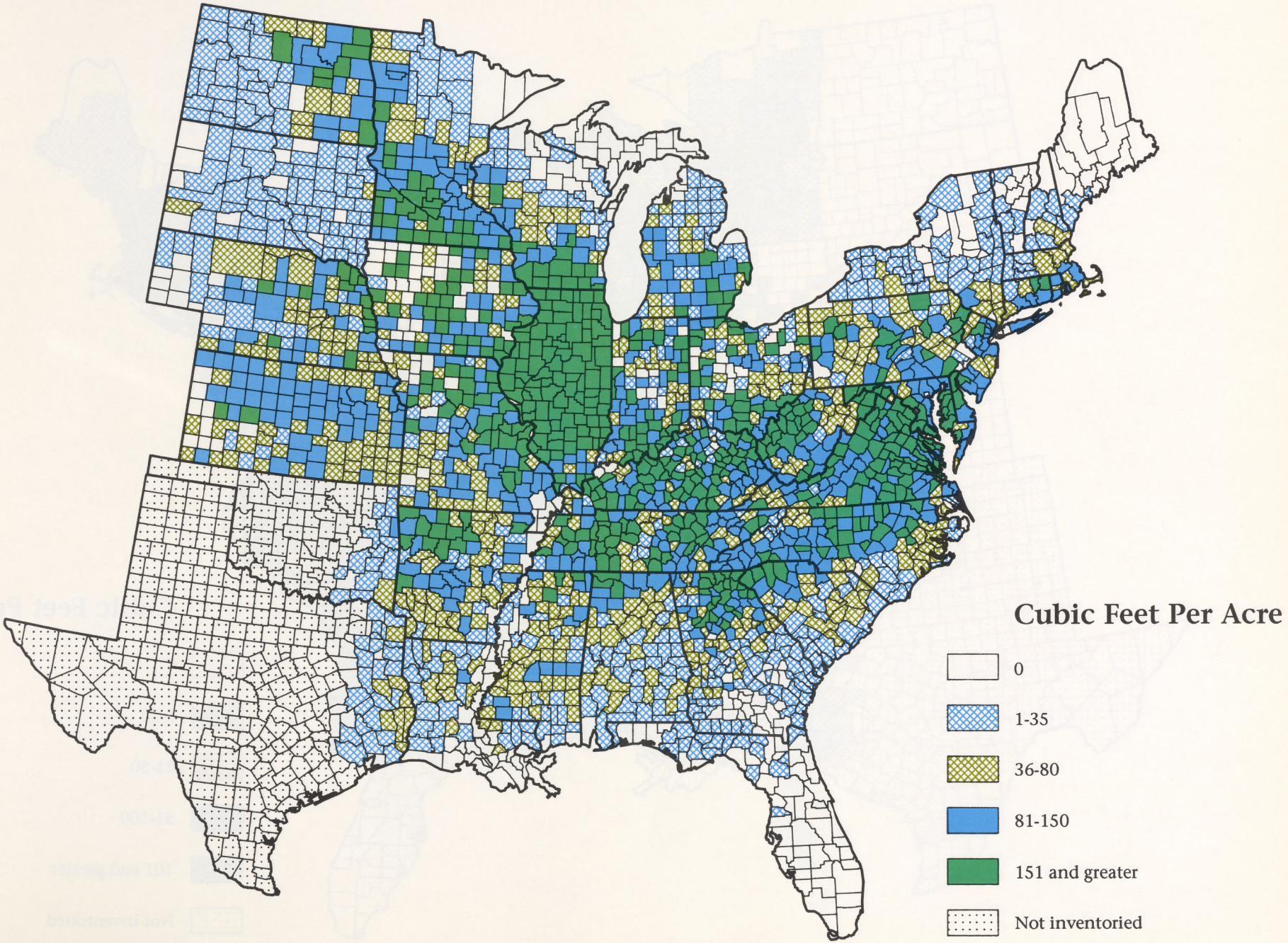


Figure 15 – **Select red oak growing-stock volume.**

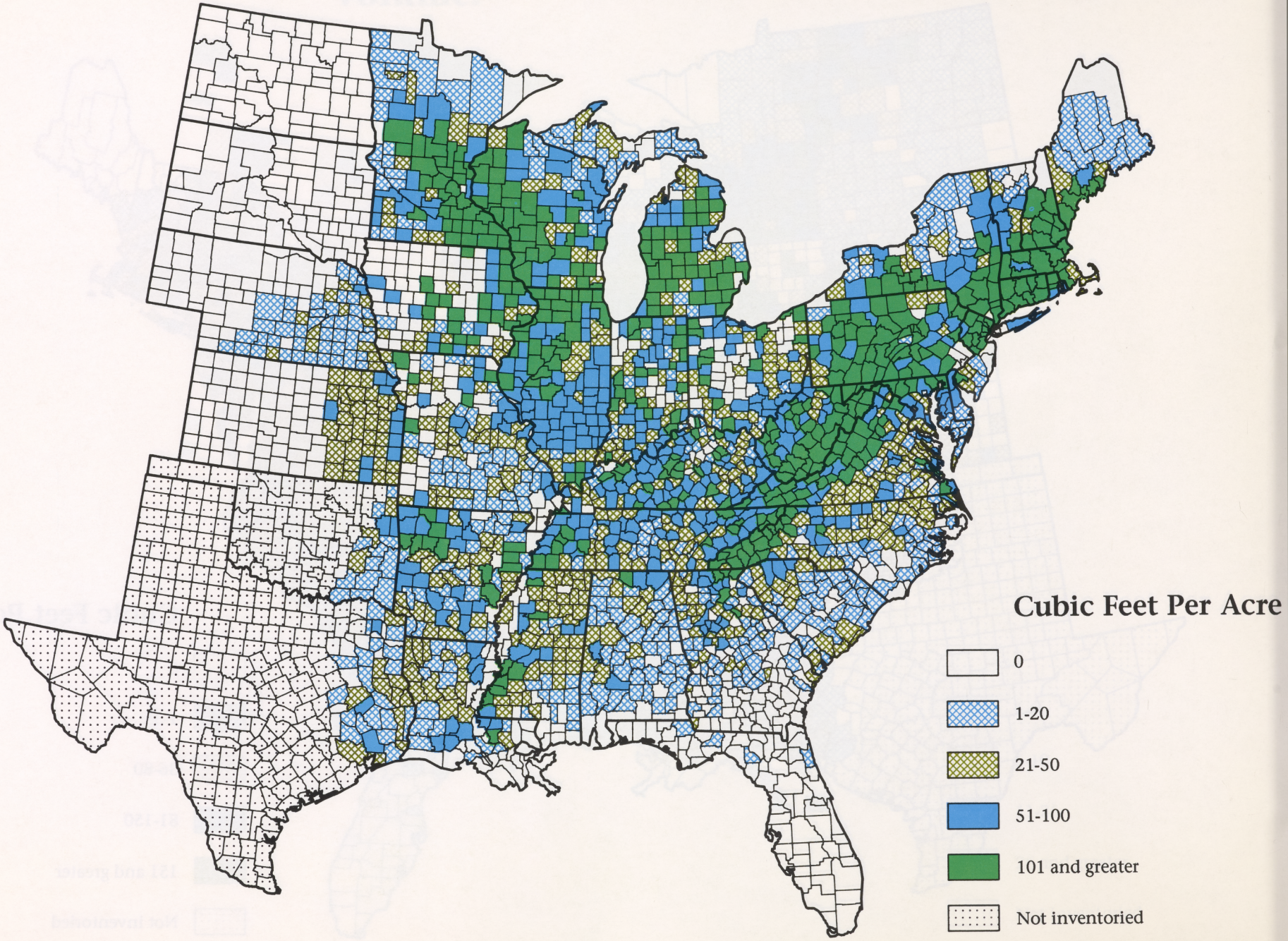


Figure 16 – **Other white oak growing-stock volume.**

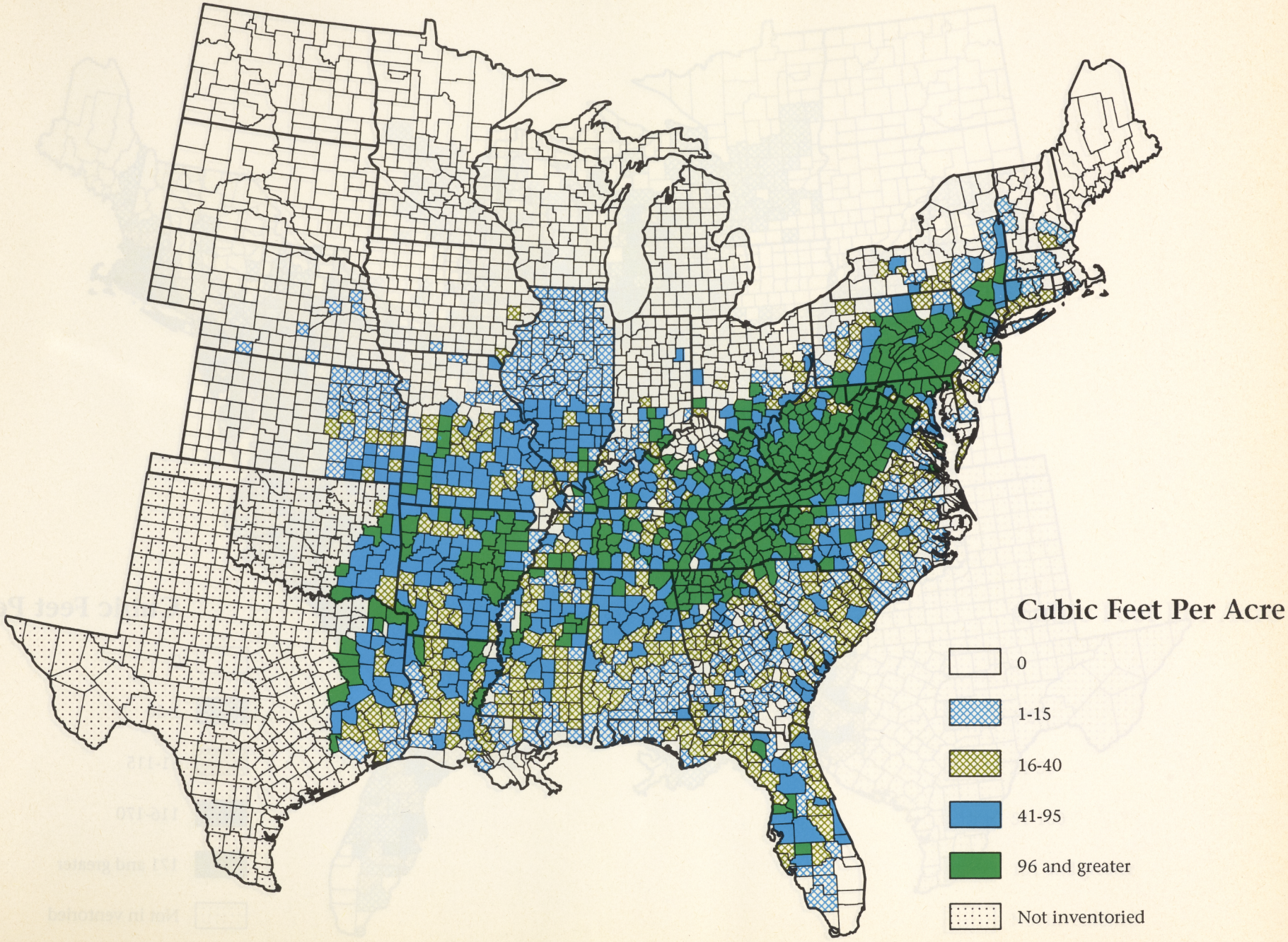


Figure 17 – **Other red oak growing-stock volume.**

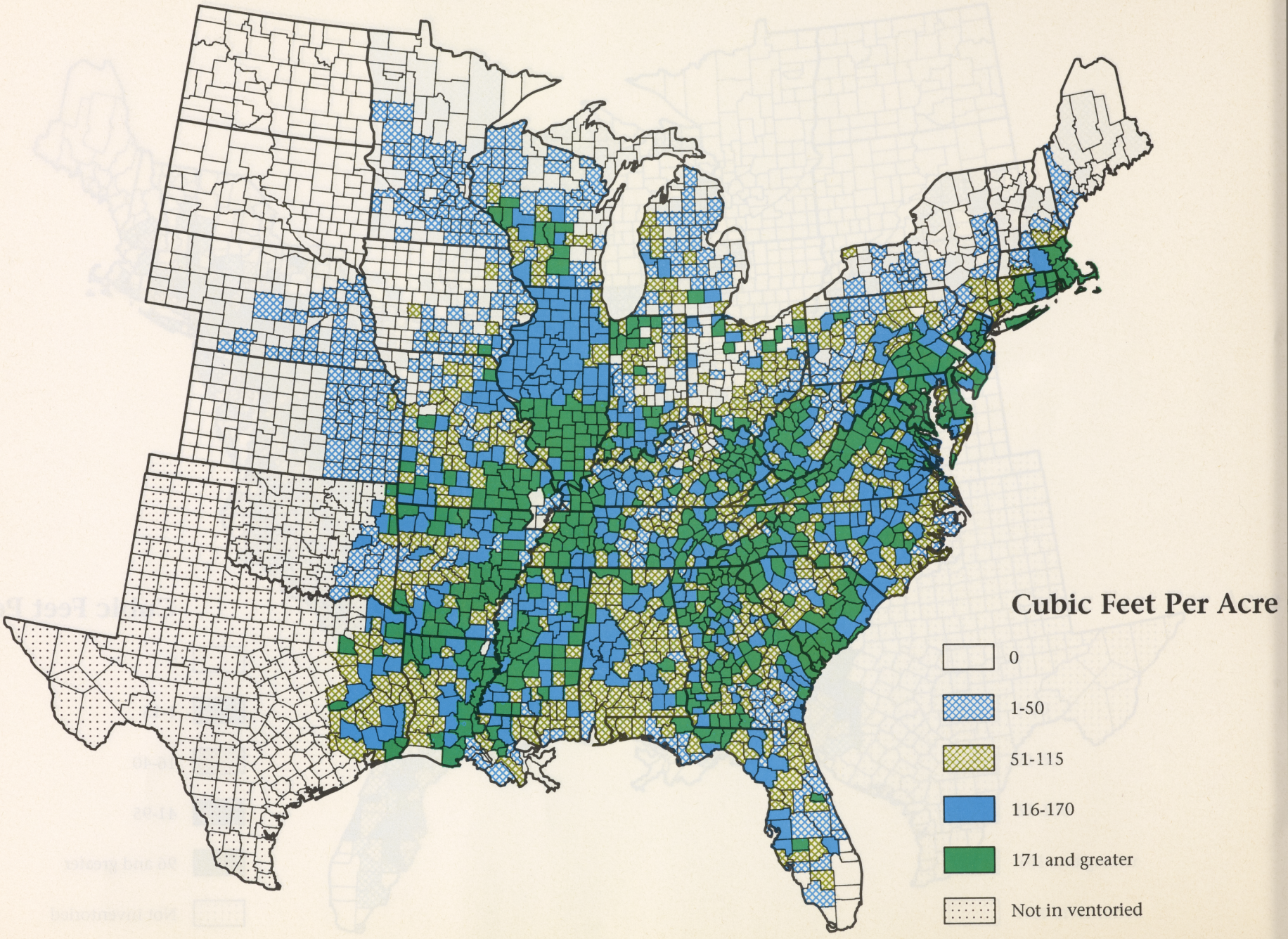


Figure 18 – **Hickory growing-stock volume.**

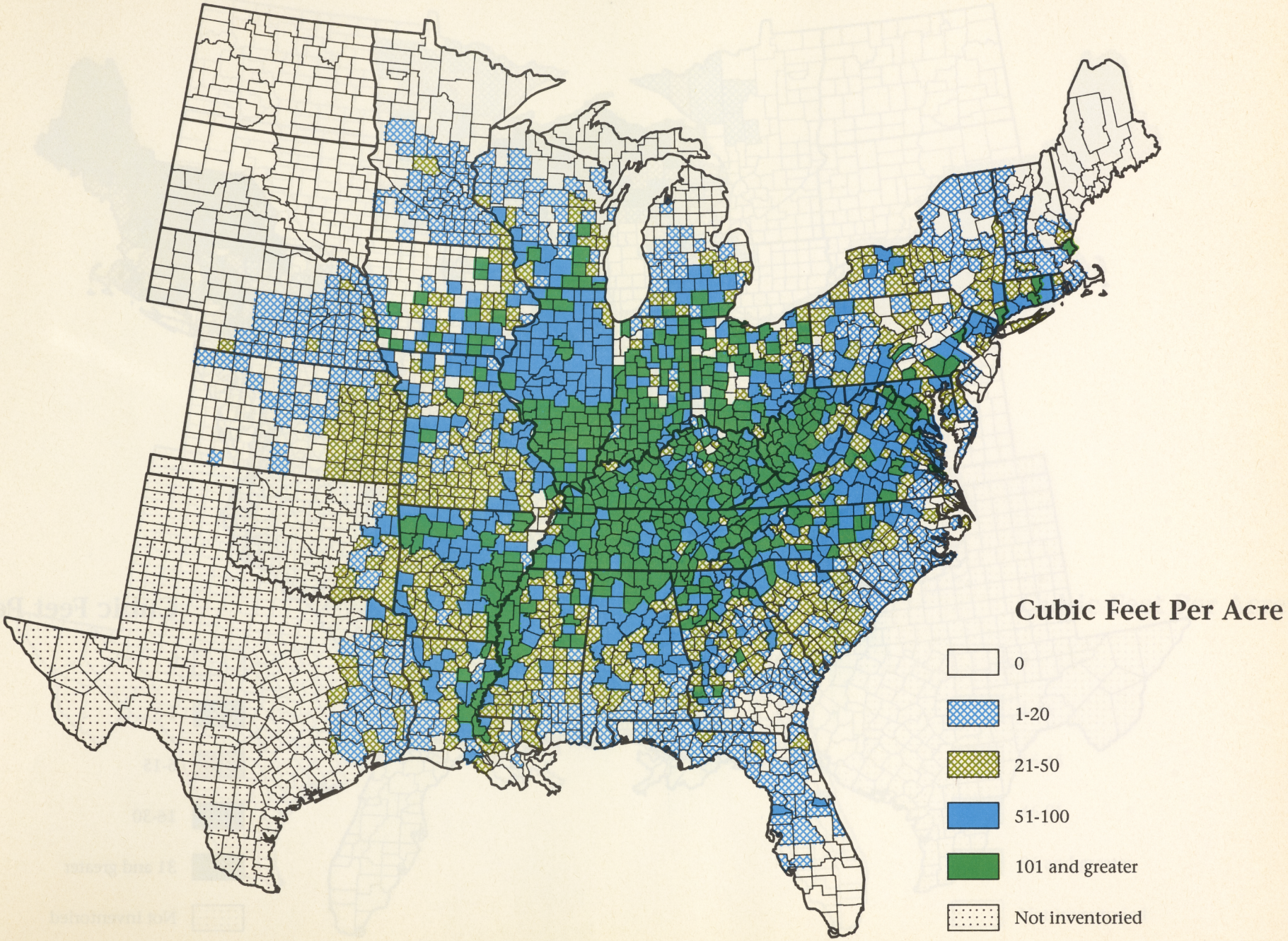


Figure 19 – **Yellow birch growing-stock volume.**

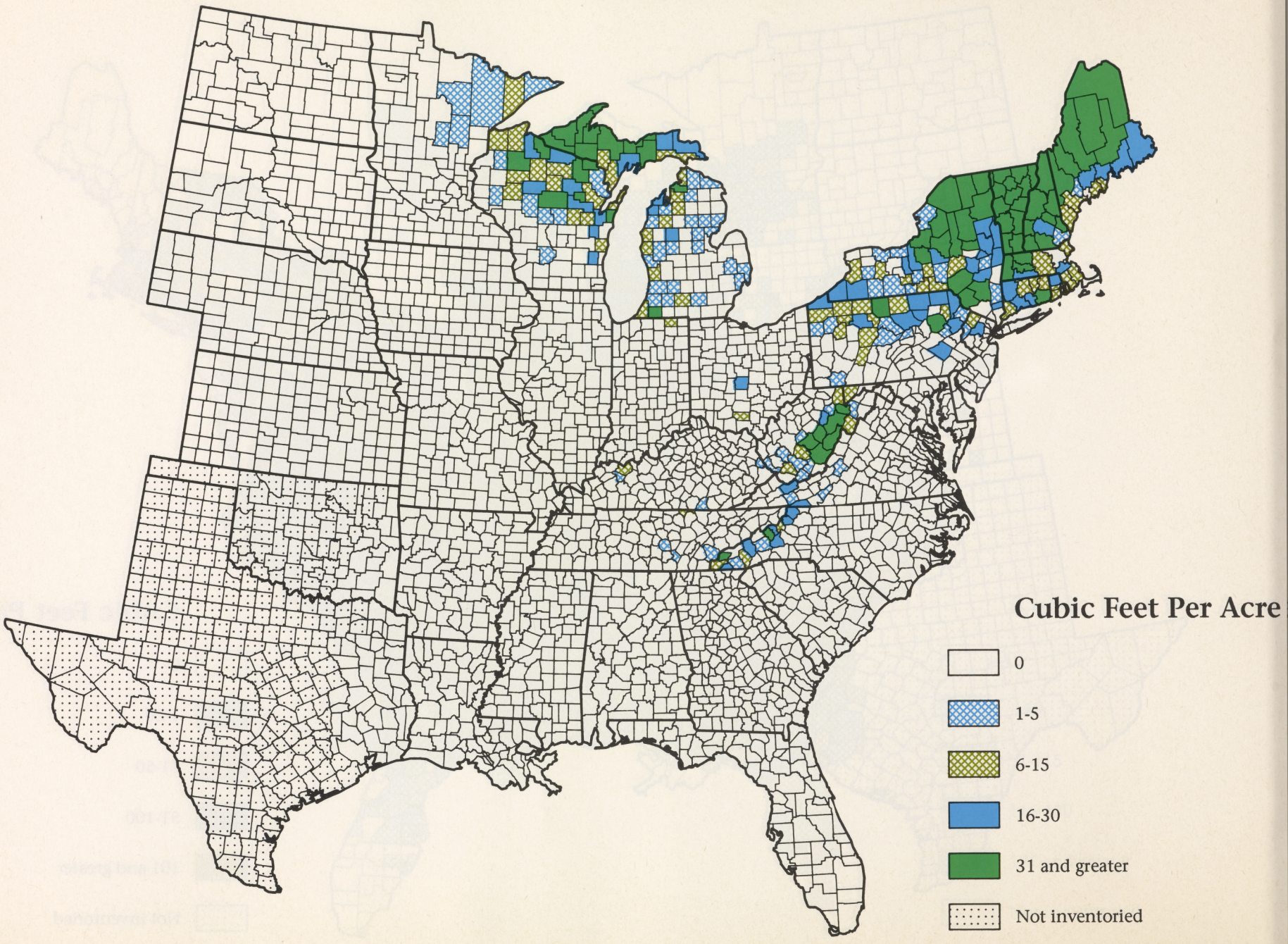


Figure 20 – **Hard maple growing-stock volume.**

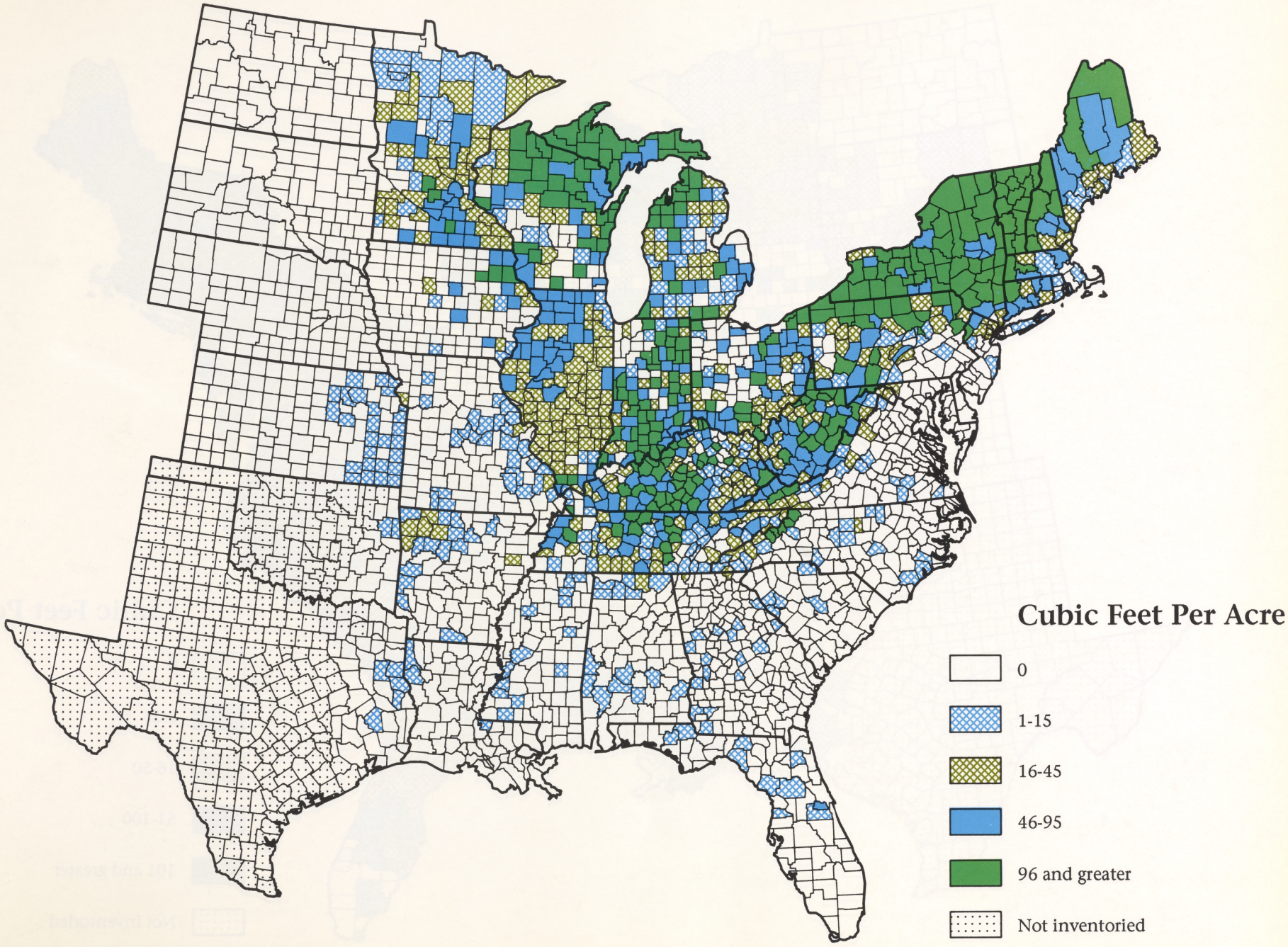


Figure 21 – **Soft maple growing-stock volume.**

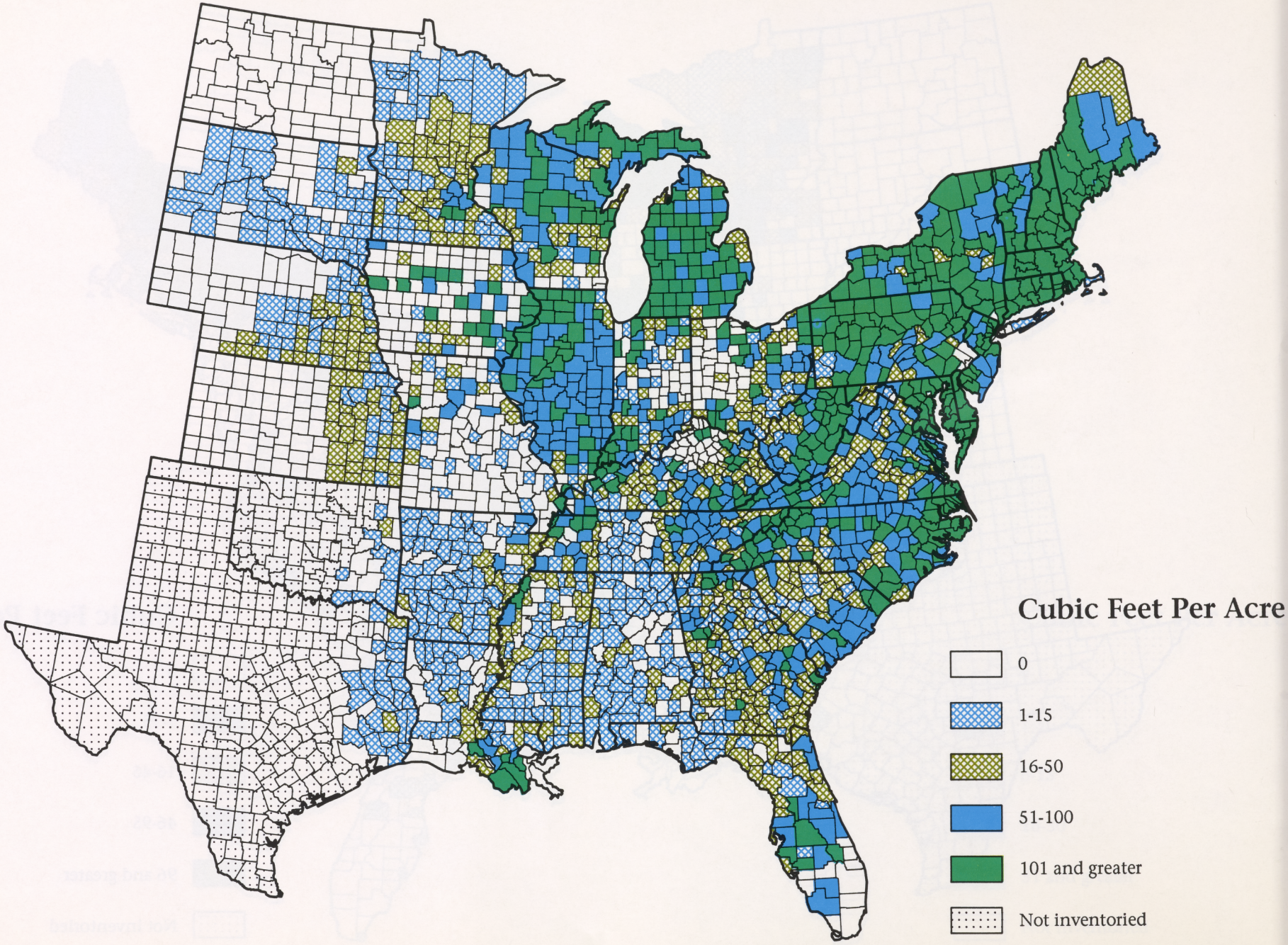


Figure 22 – **Beech growing-stock volume.**

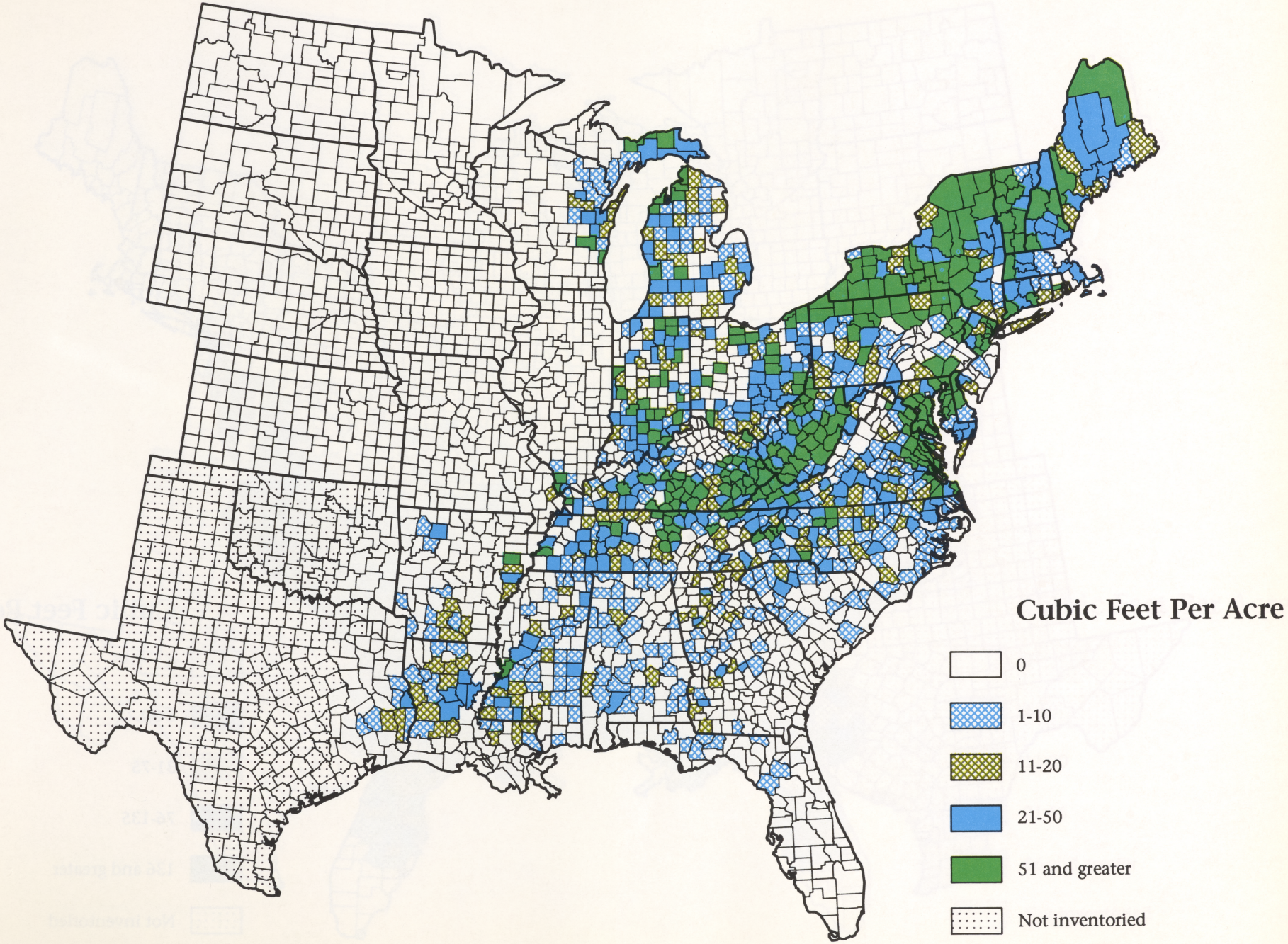


Figure 23 – **Sweetgum growing-stock volume.**

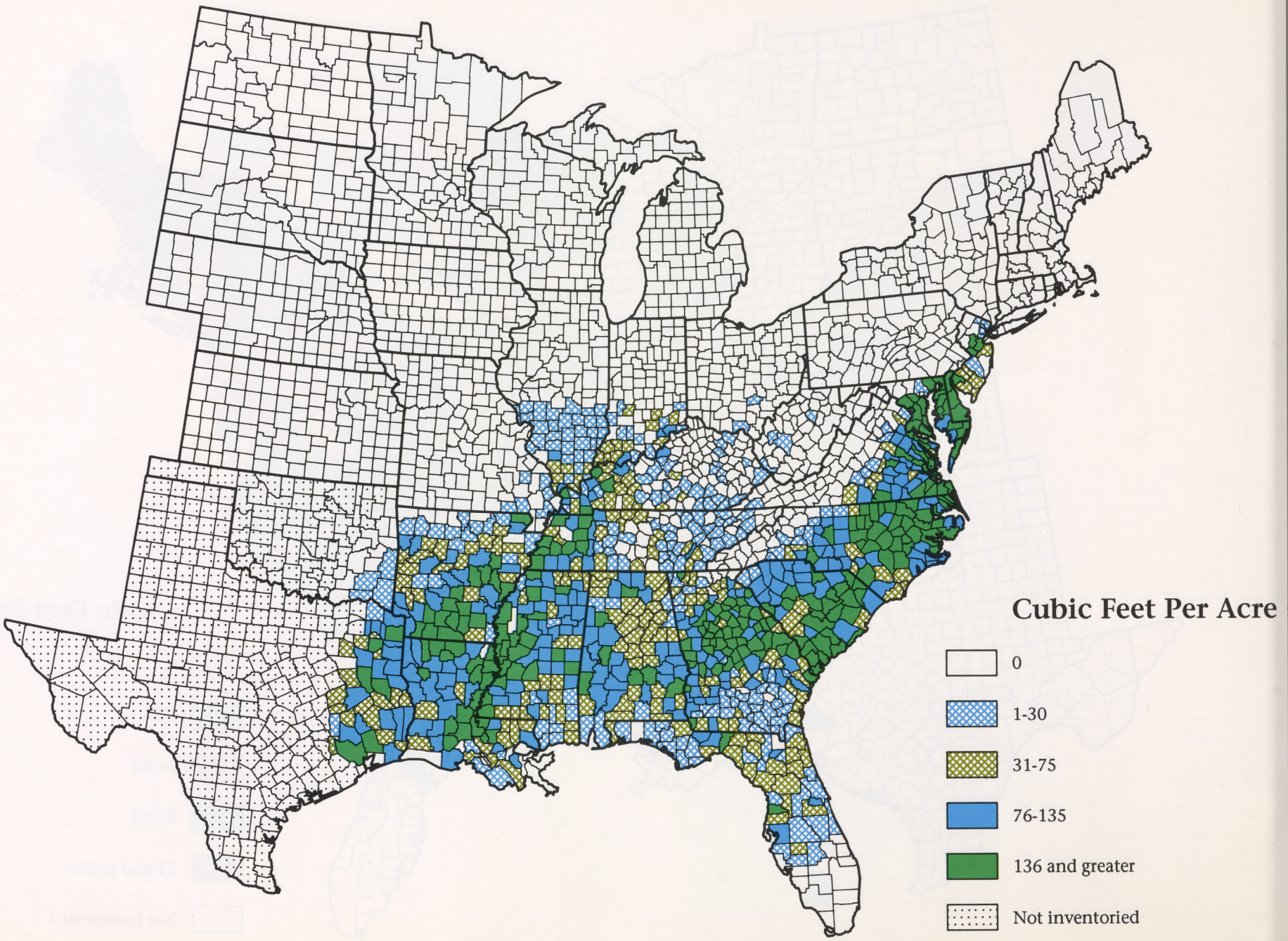


Figure 24 – **Tupelo and blackgum growing-stock volume.**

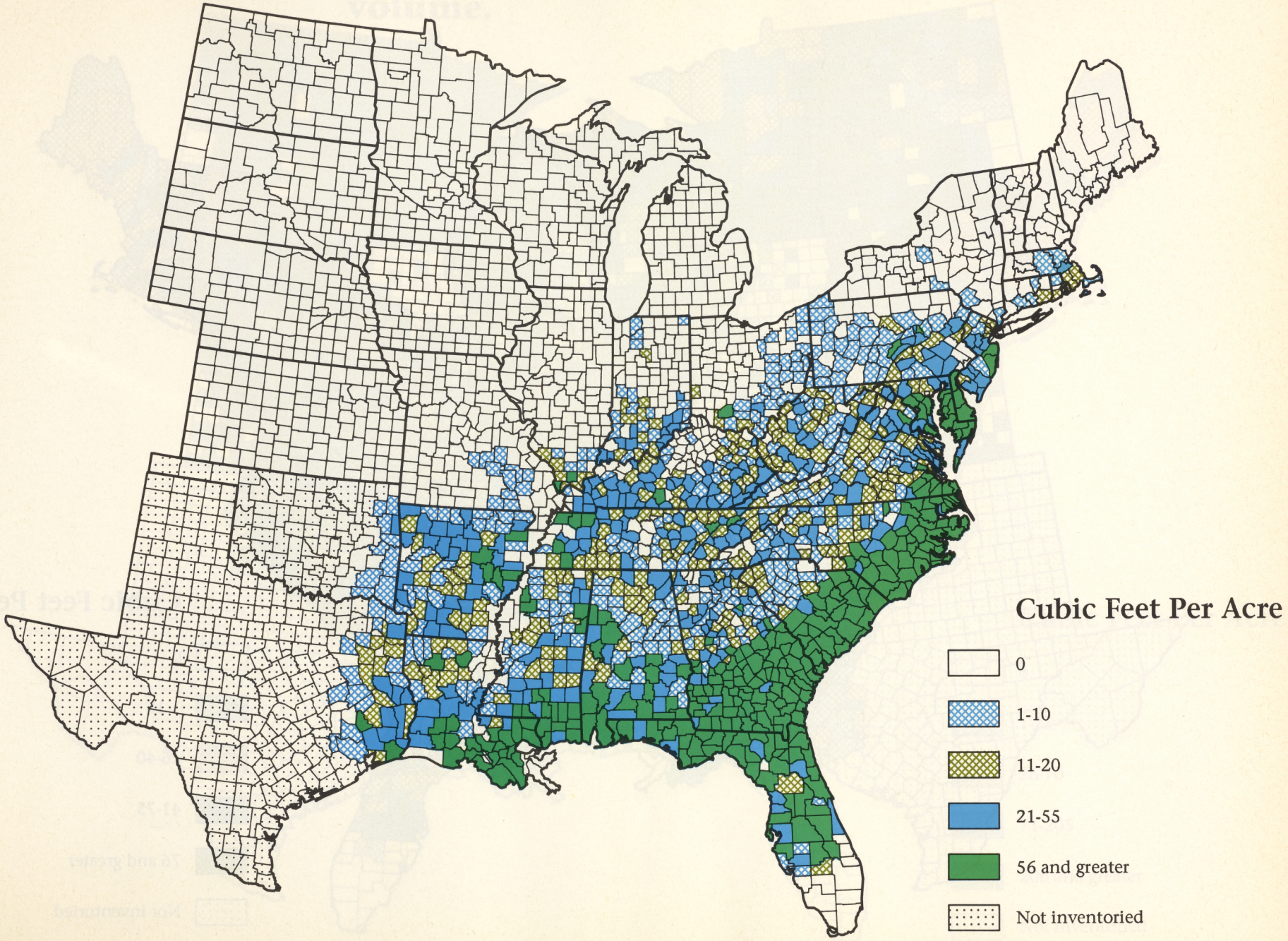


Figure 25 – **Ash growing-stock volume.**

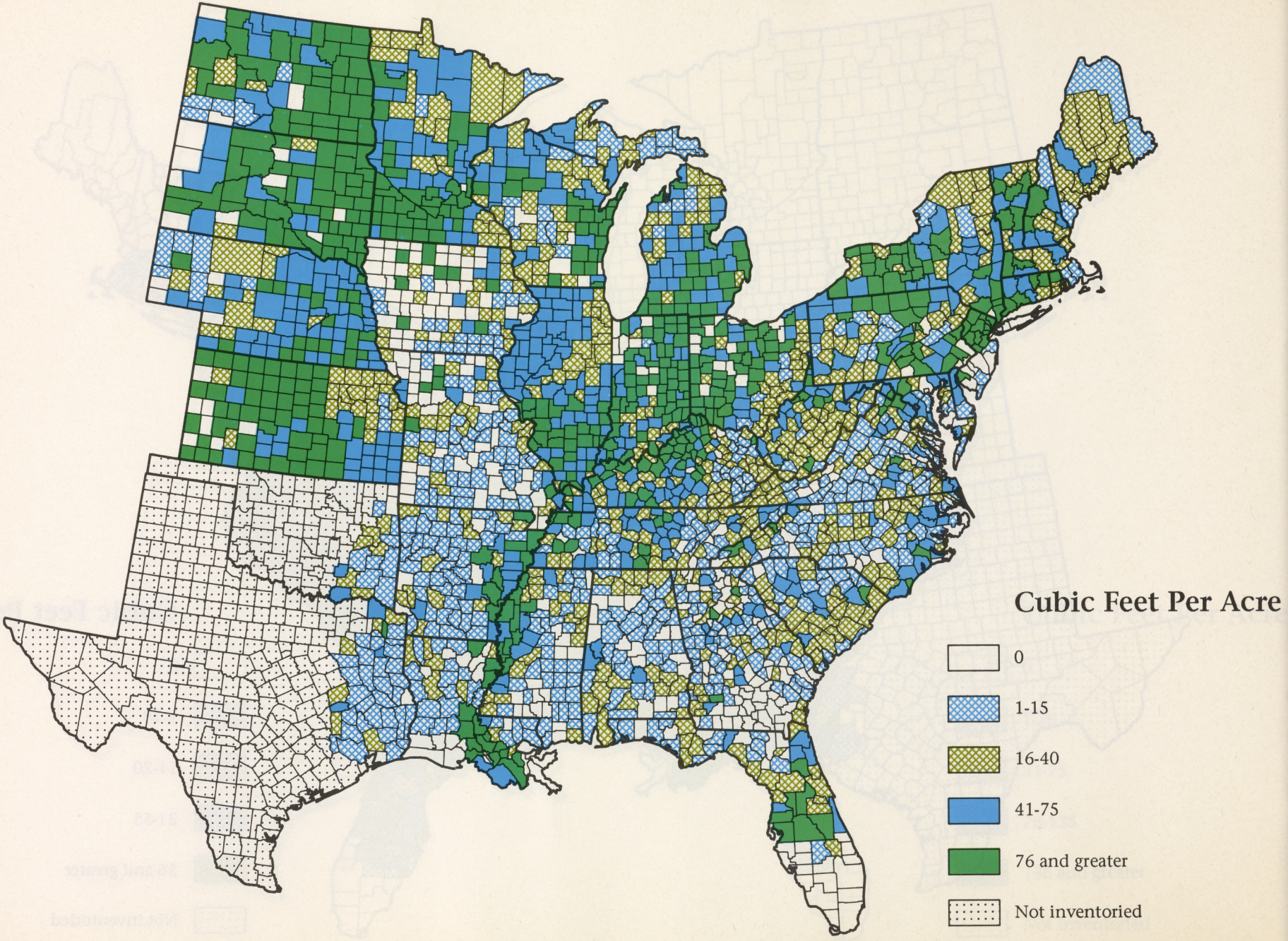


Figure 26 – **Cottonwood and aspen growing-stock volume.**

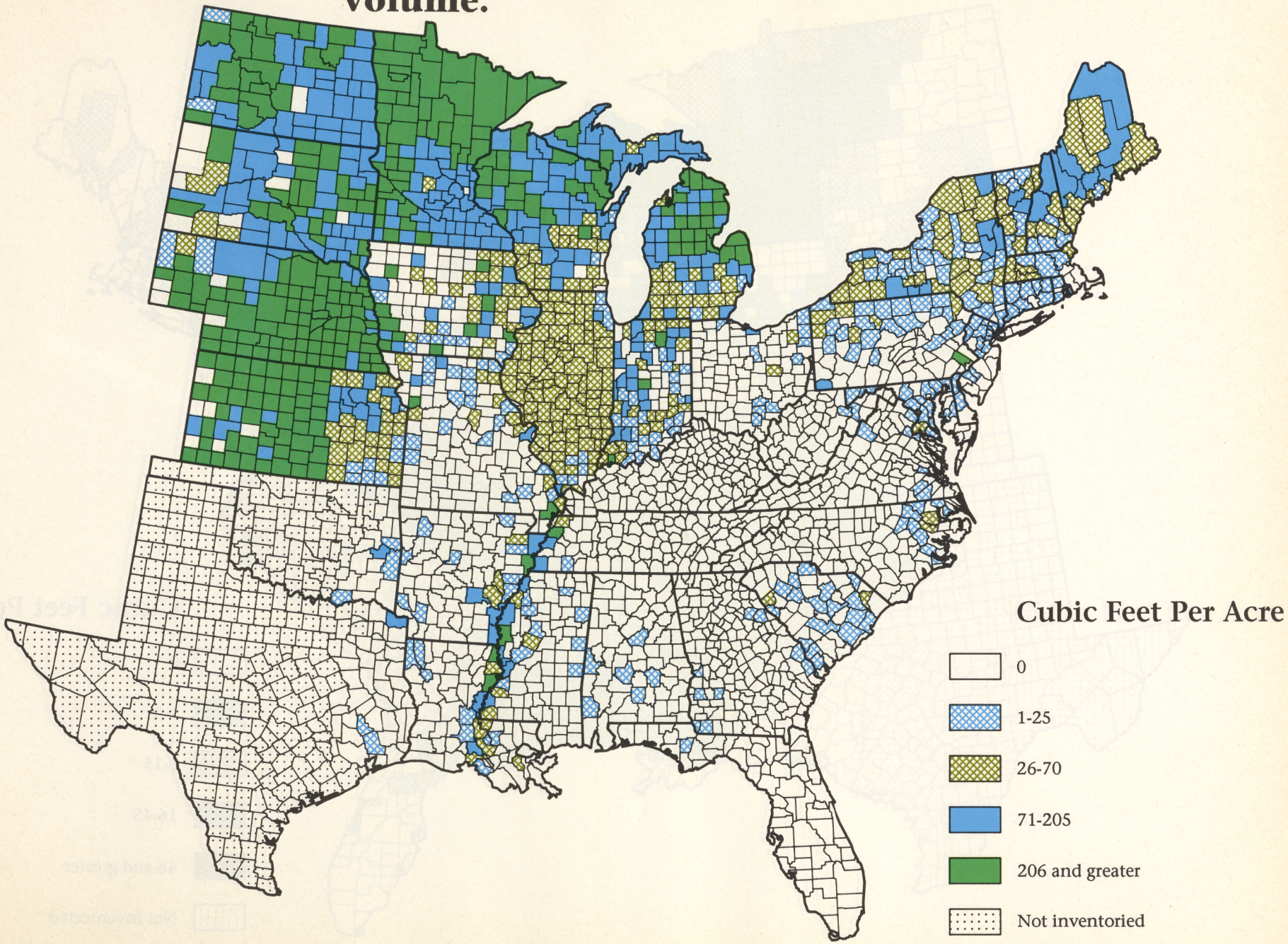


Figure 27 – **Basswood growing-stock volume.**

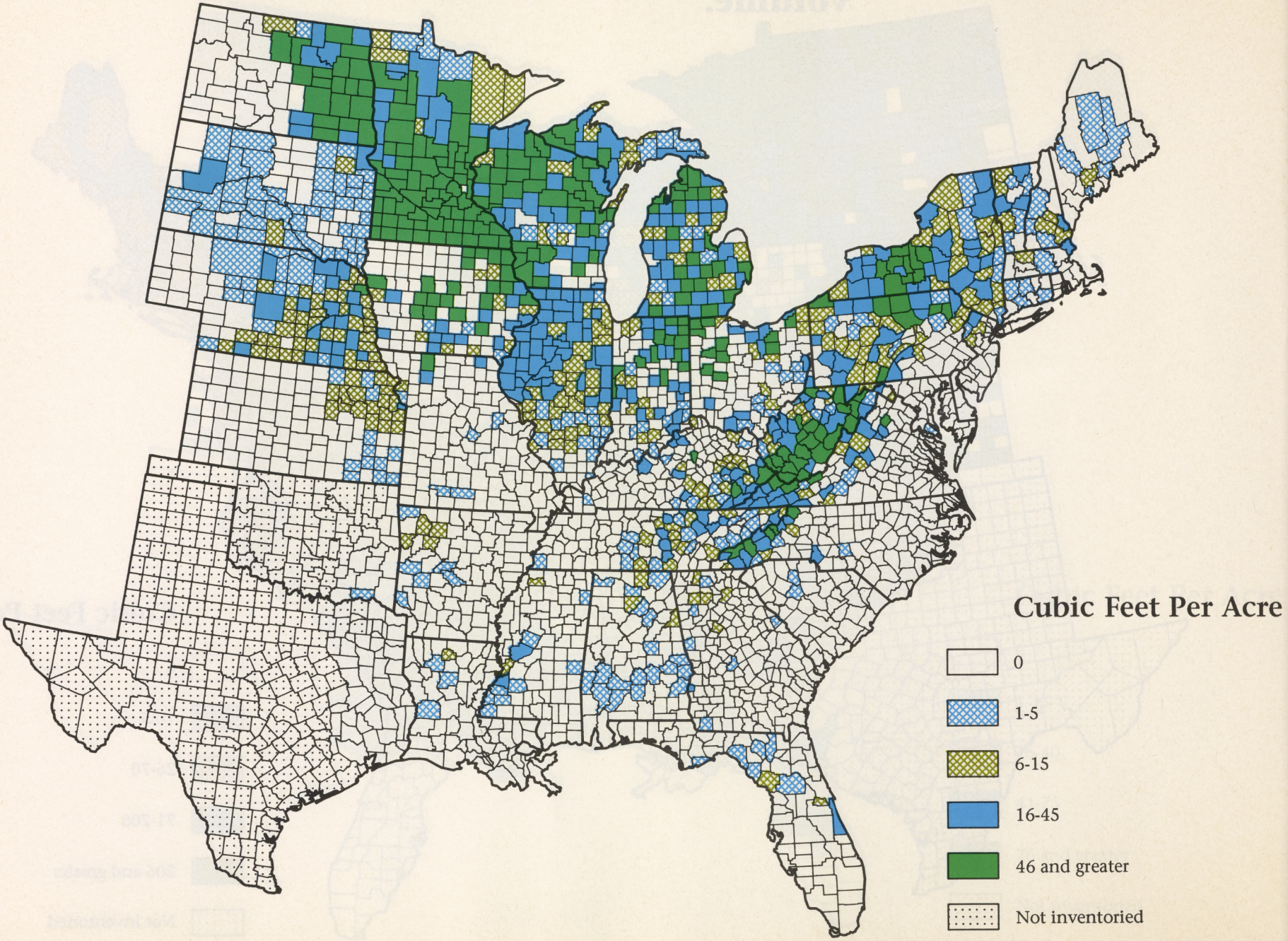


Figure 28 – **Yellow-poplar growing-stock volume.**

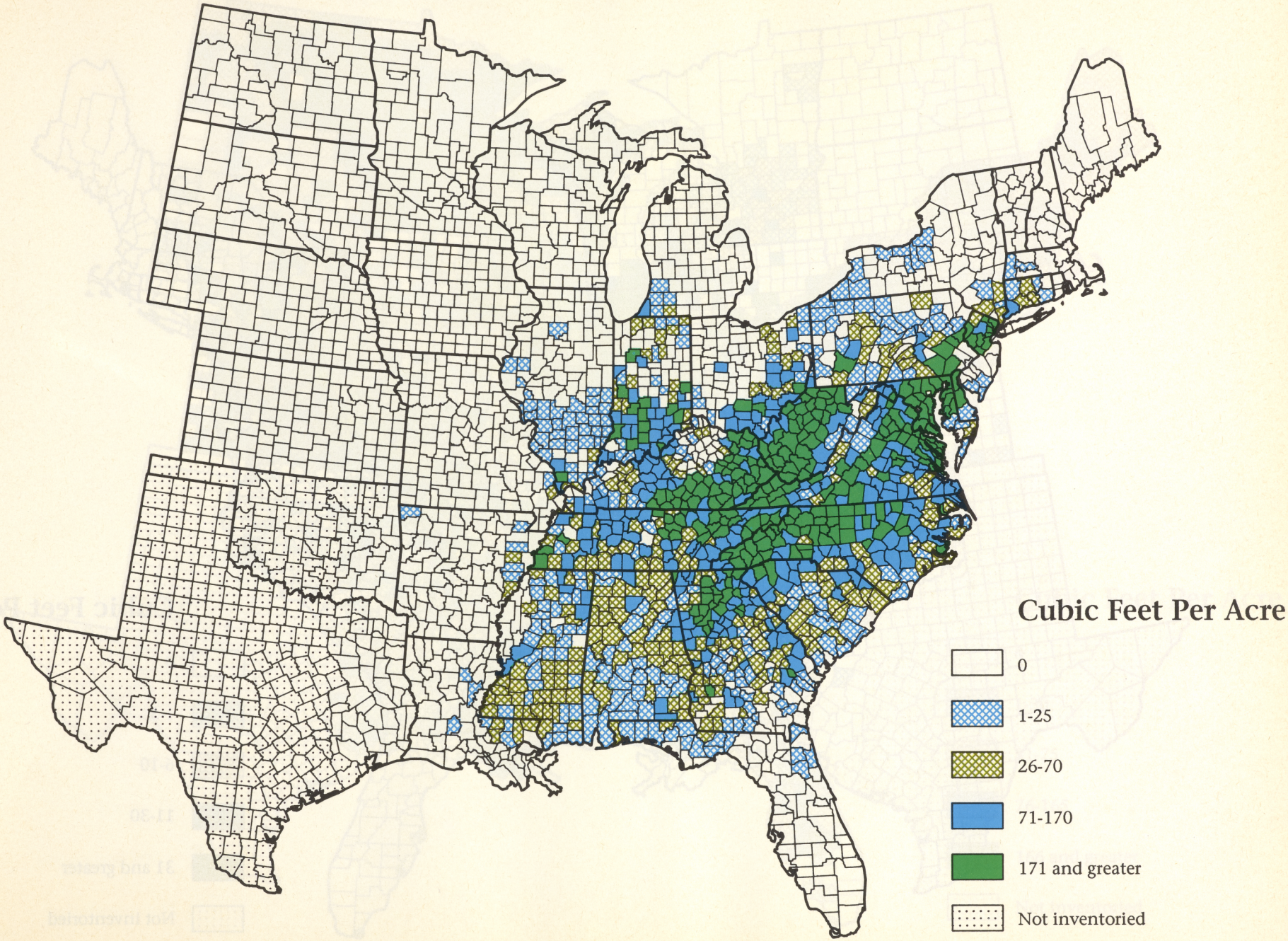


Figure 29 – **Black walnut growing-stock volume.**

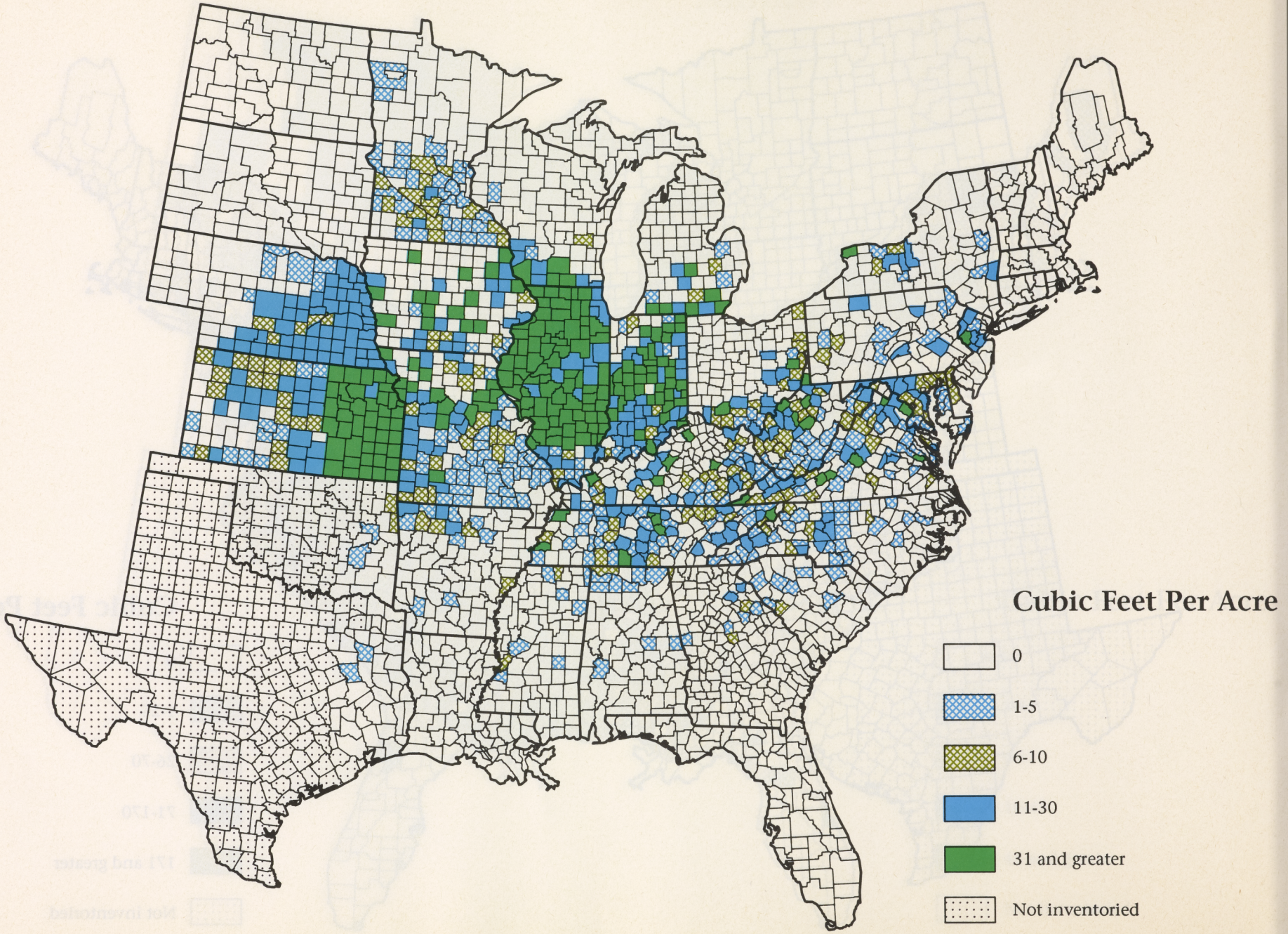


Figure 30 – **Other eastern hardwood growing-stock volume.**

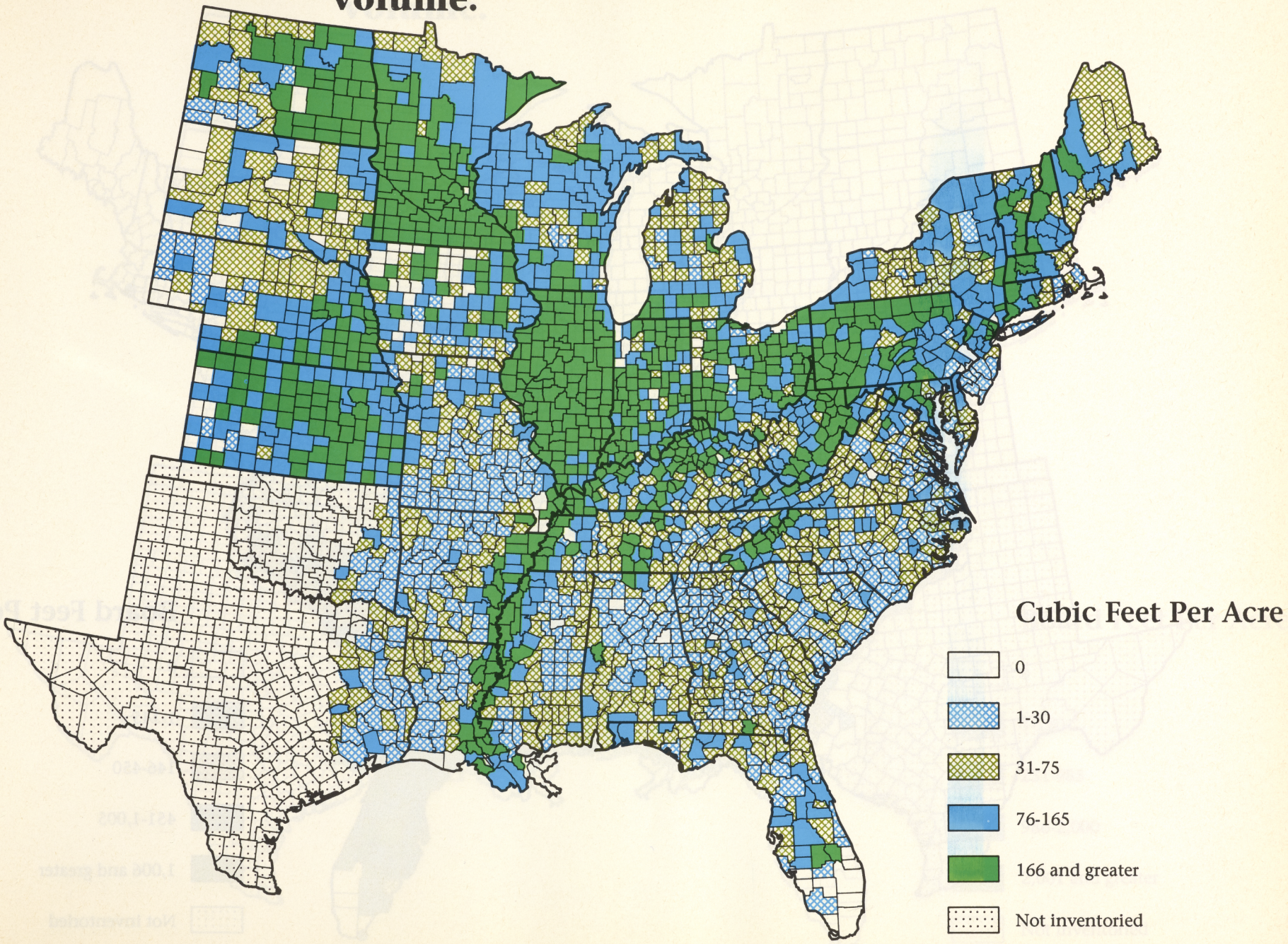


Figure 31 – **Longleaf and slash pine board-foot volume.**

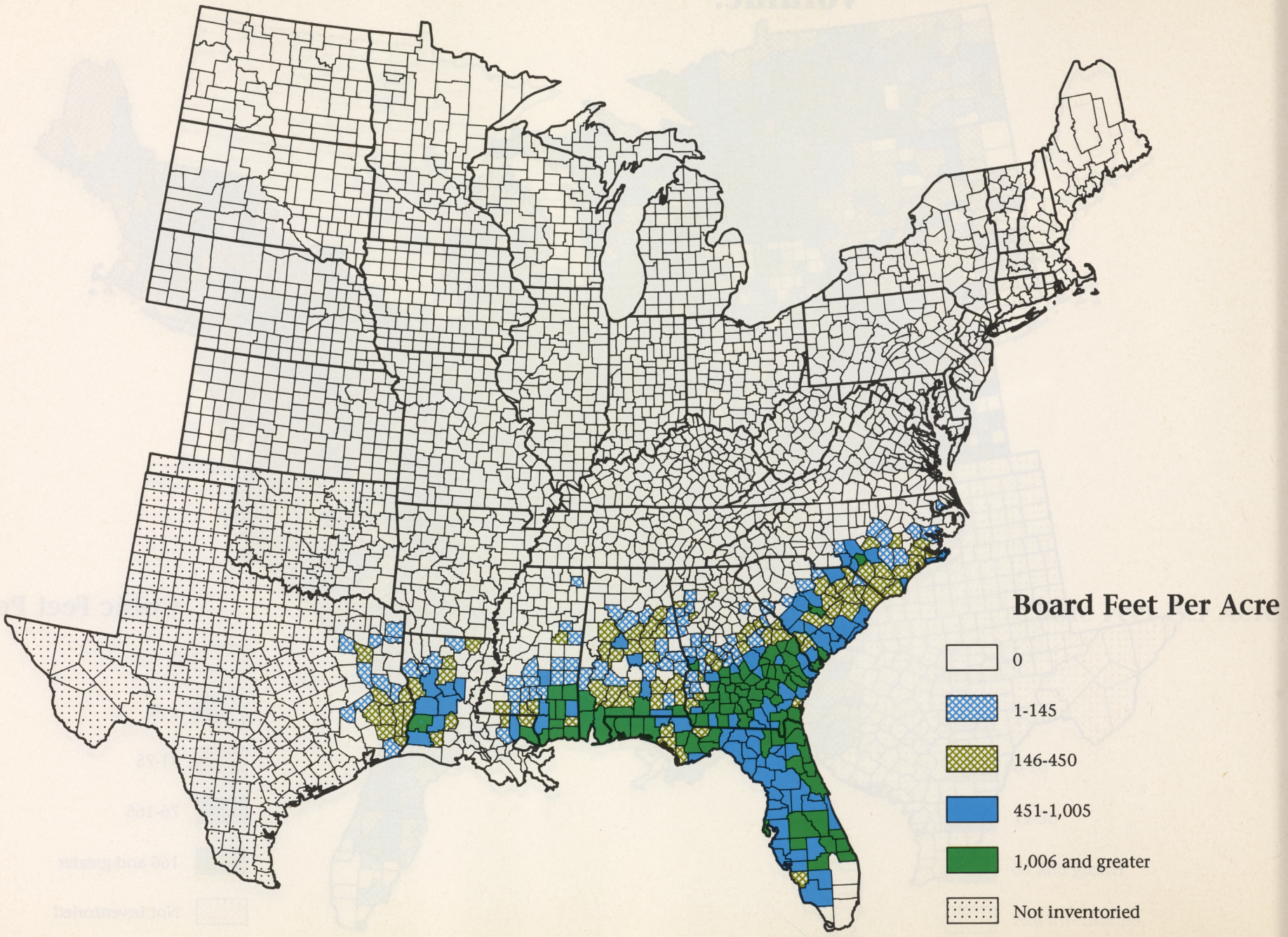


Figure 32 – **Loblolly and shortleaf pine board-foot volume.**

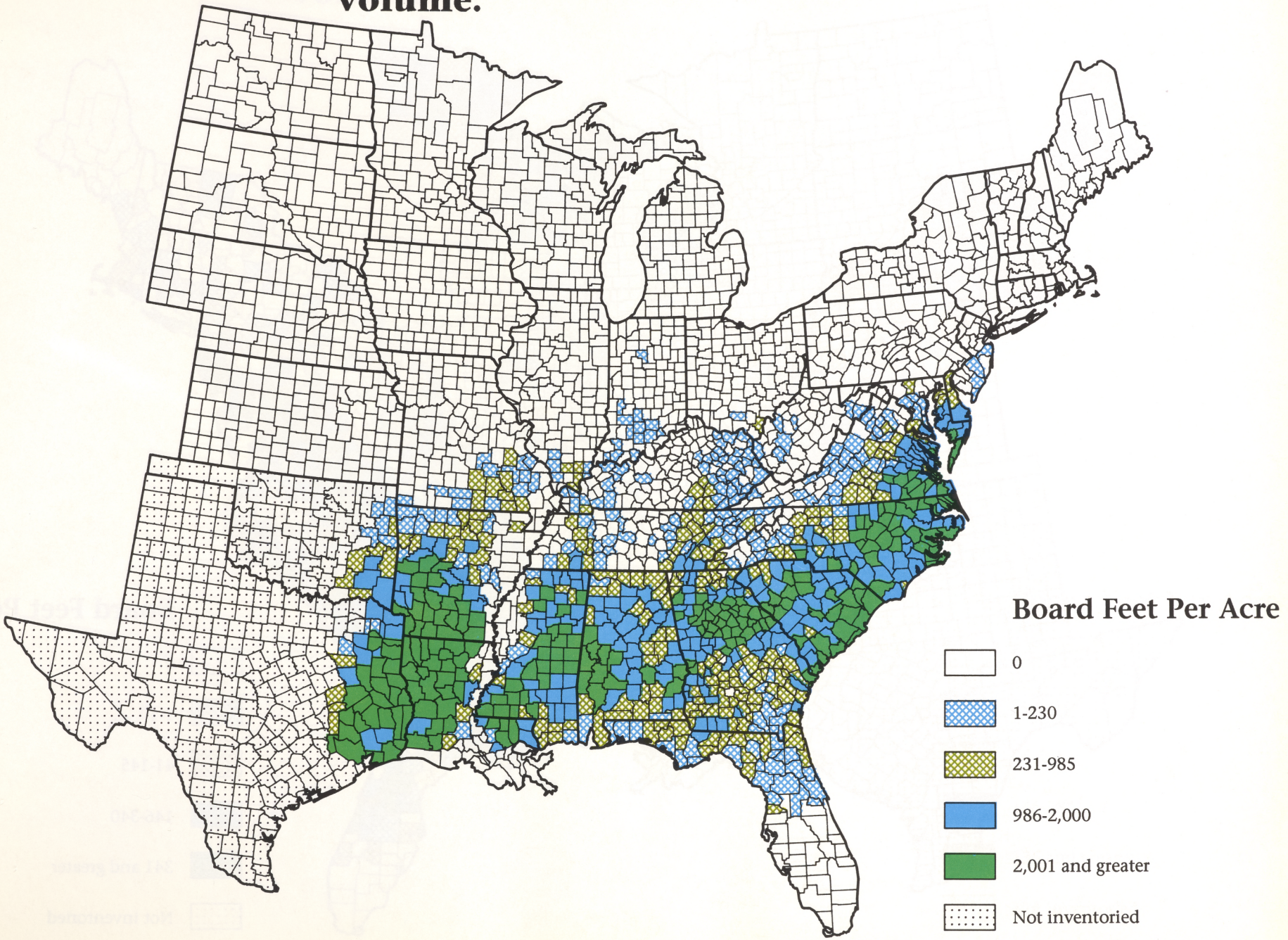


Figure 33 – **Other yellow pine board-foot volume.**

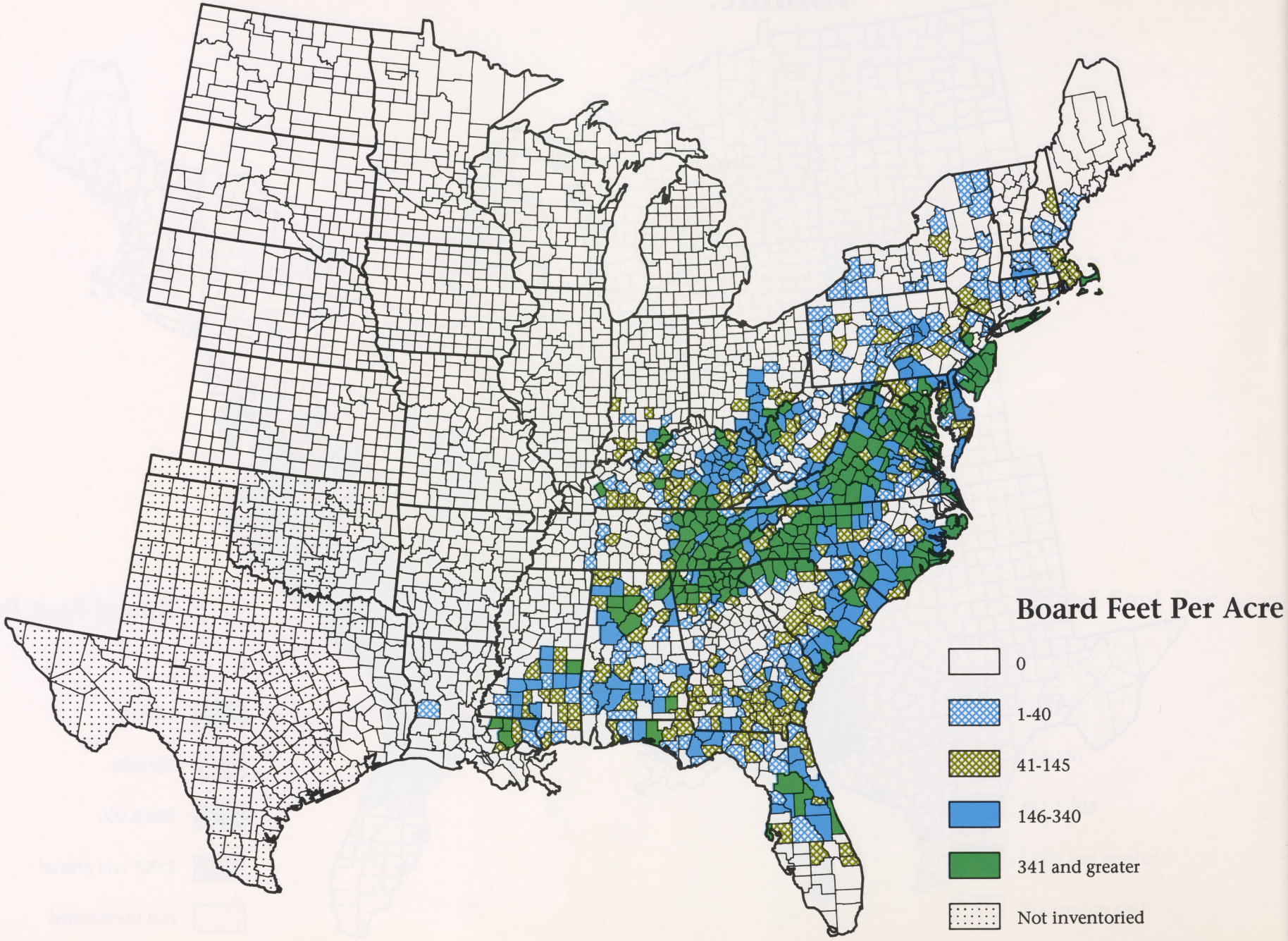


Figure 34 – **Eastern white pine and red pine board-foot volume.**

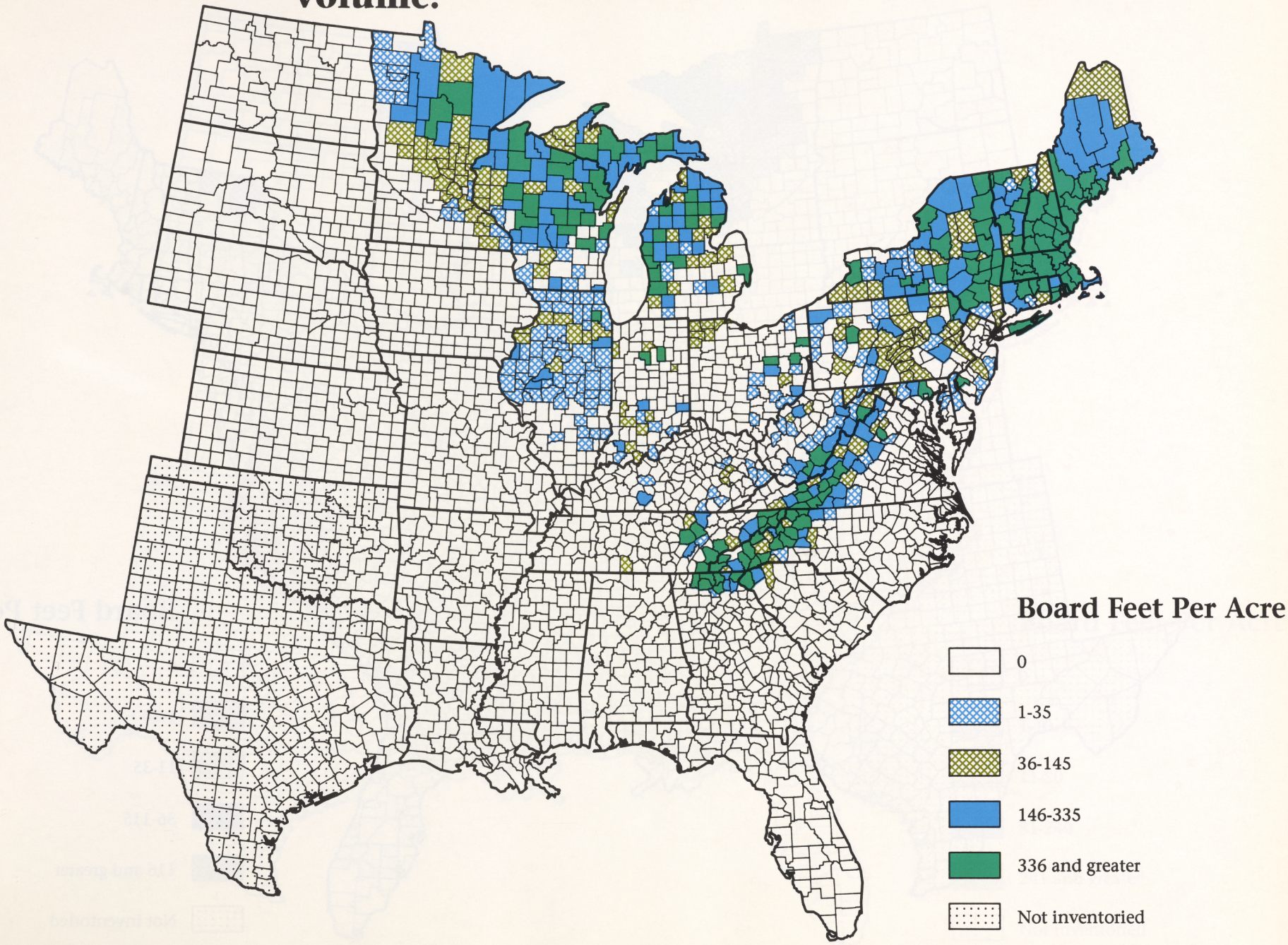


Figure 35 – **Jack pine board-foot volume.**

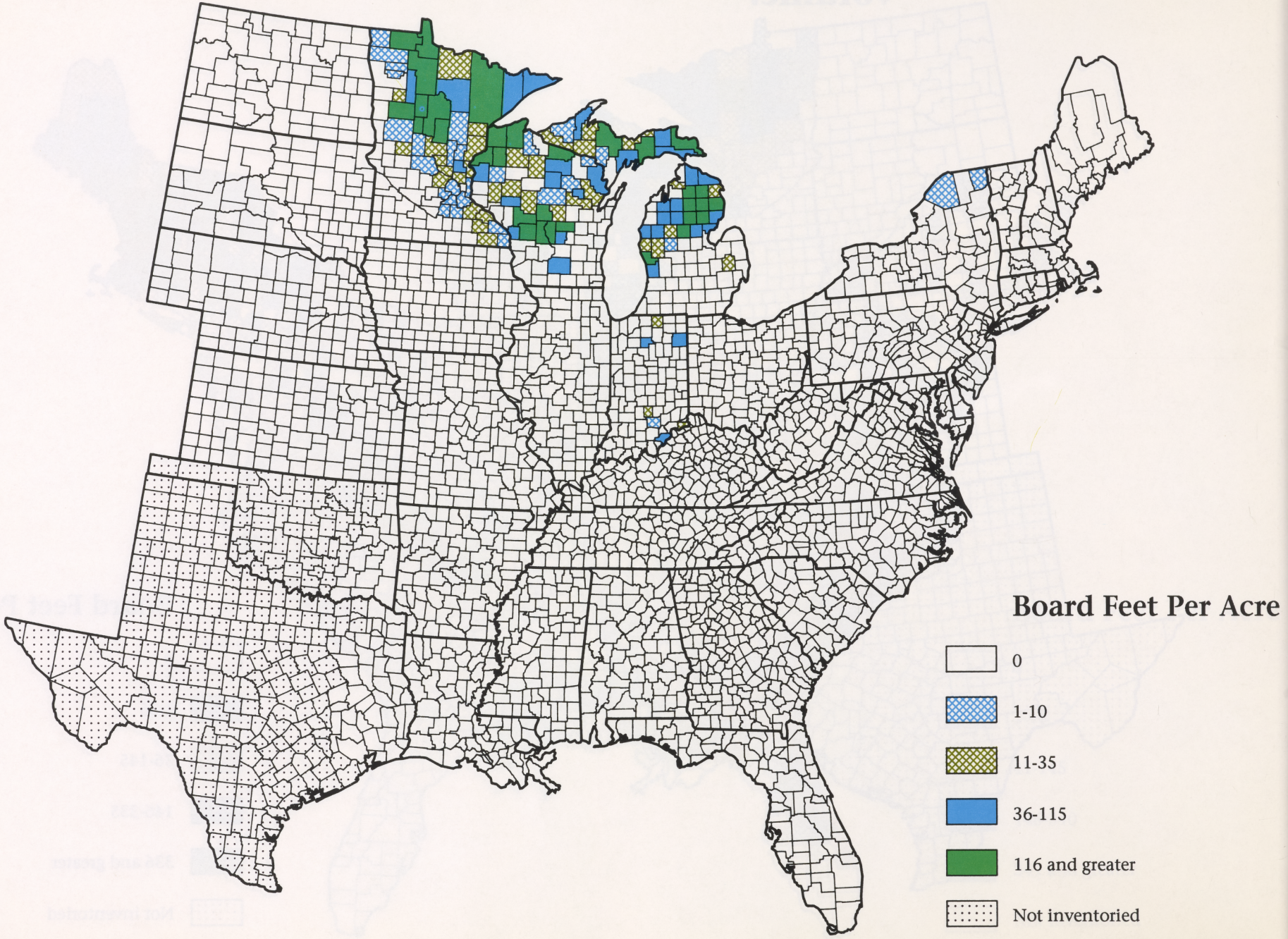


Figure 36 – **Spruce and balsam fir board-foot volume.**

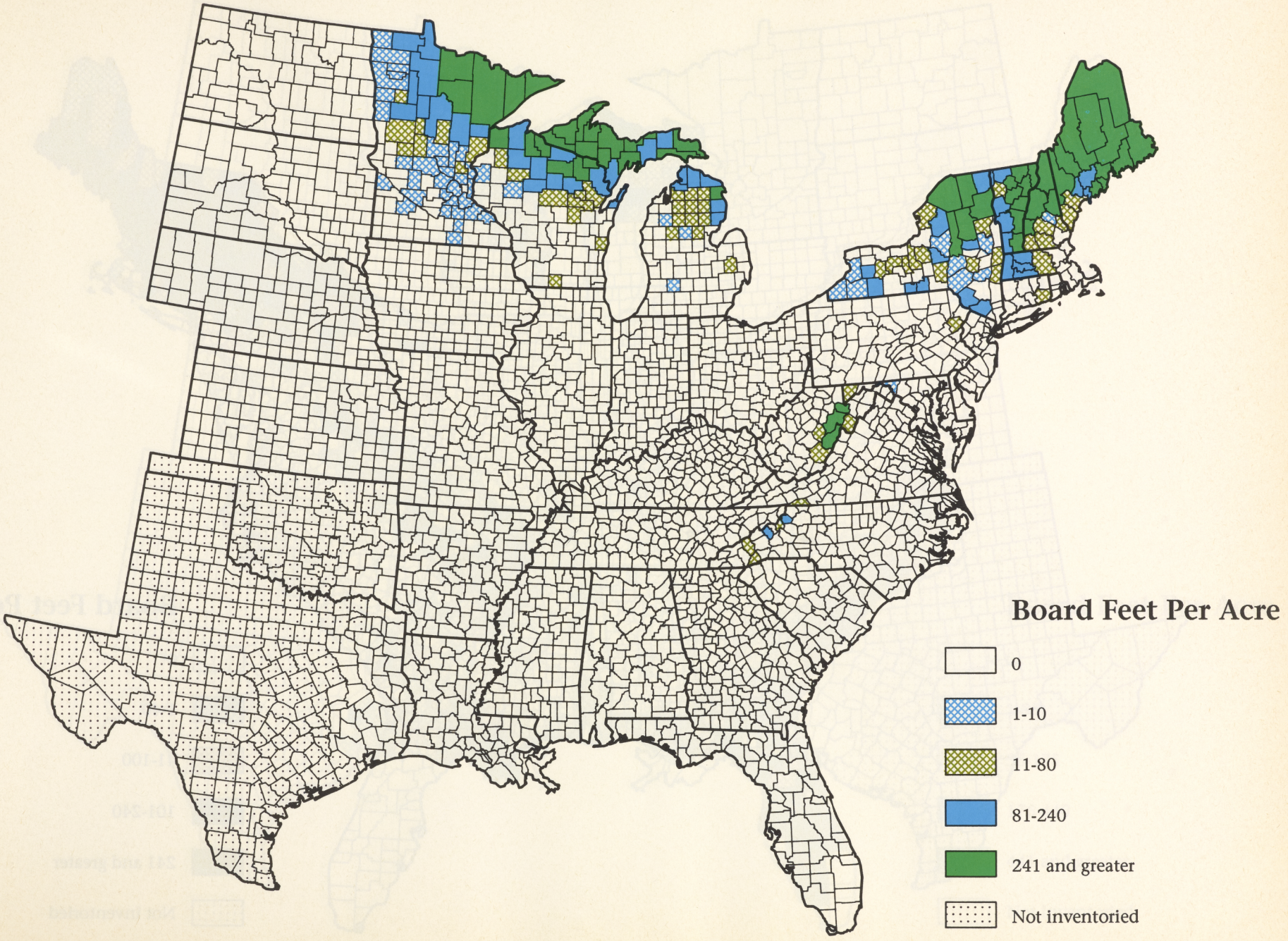


Figure 37 – **Eastern hemlock board-foot volume.**

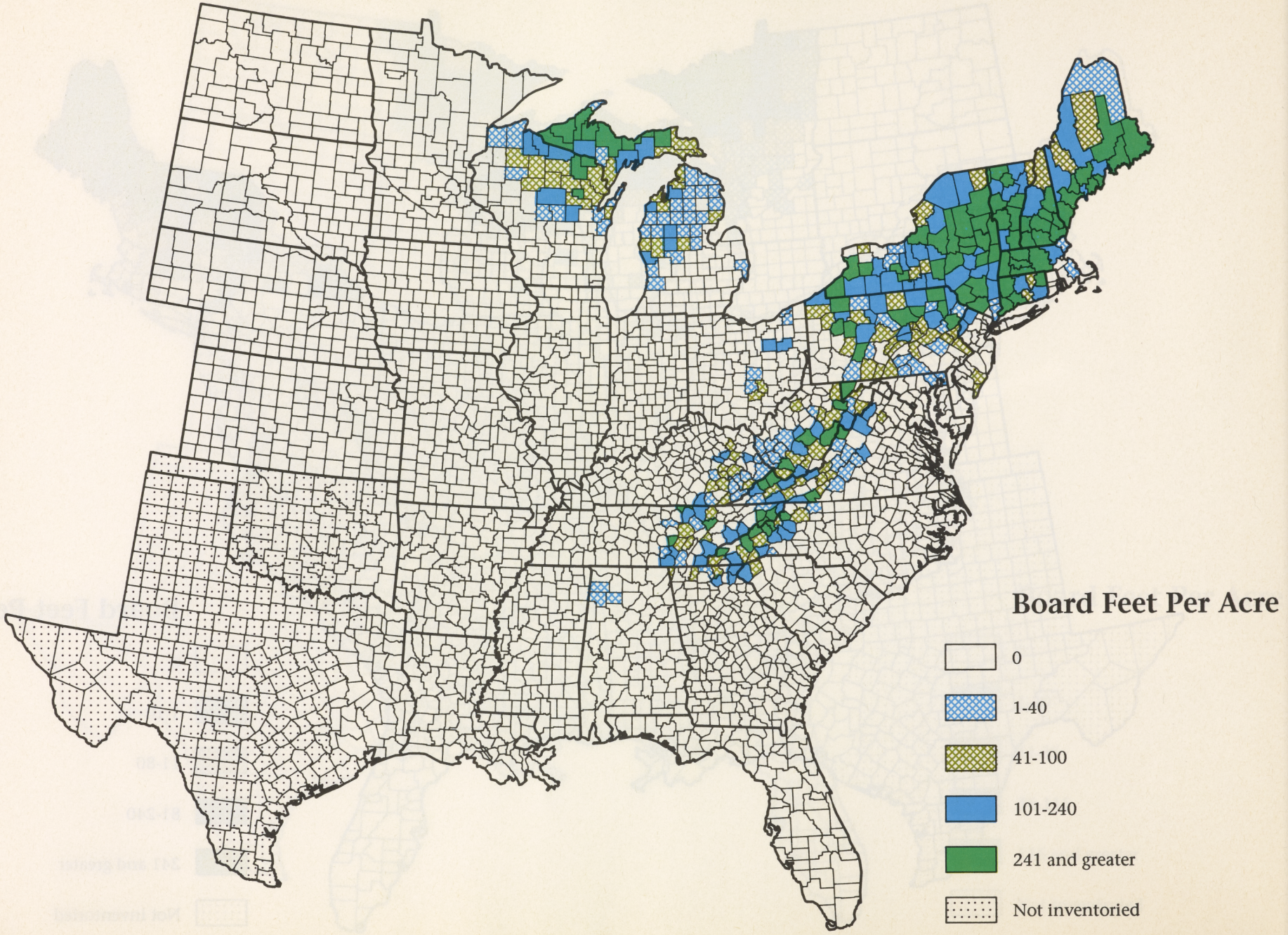


Figure 38 – **Cypress board-foot volume.**

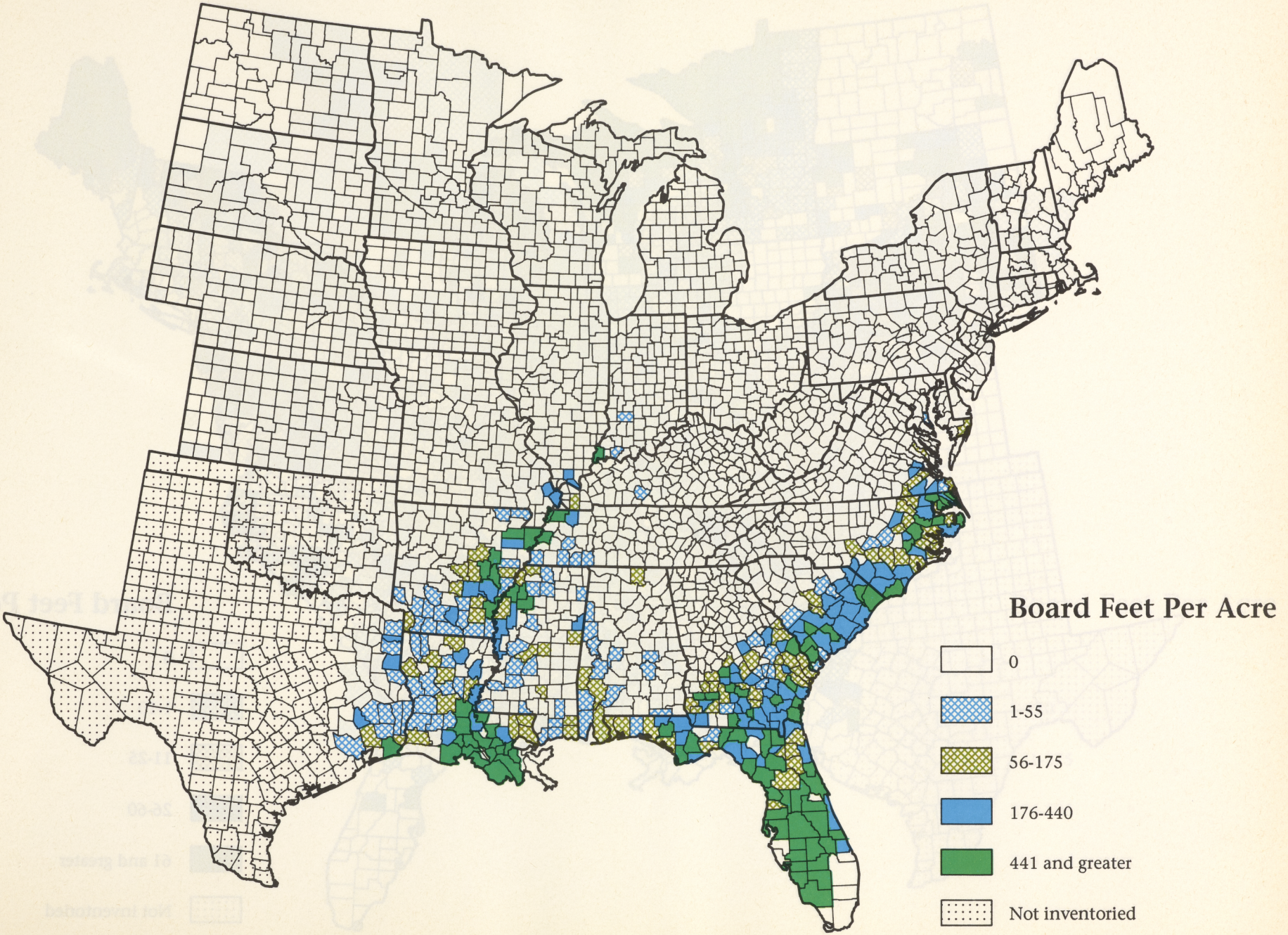


Figure 39 – **Other eastern softwood board-foot volume.**

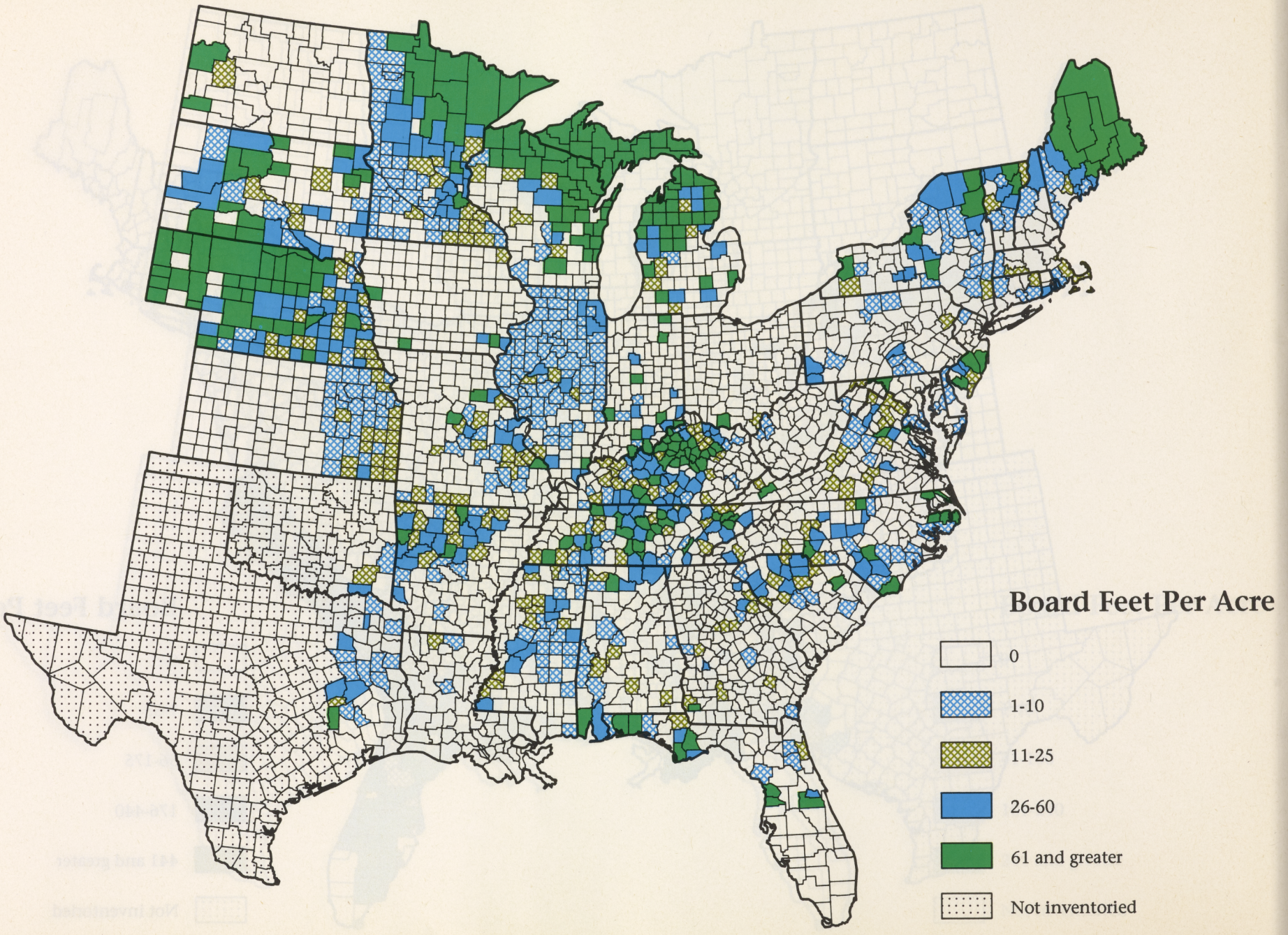


Figure 40 – **Select white oak board-foot volume.**

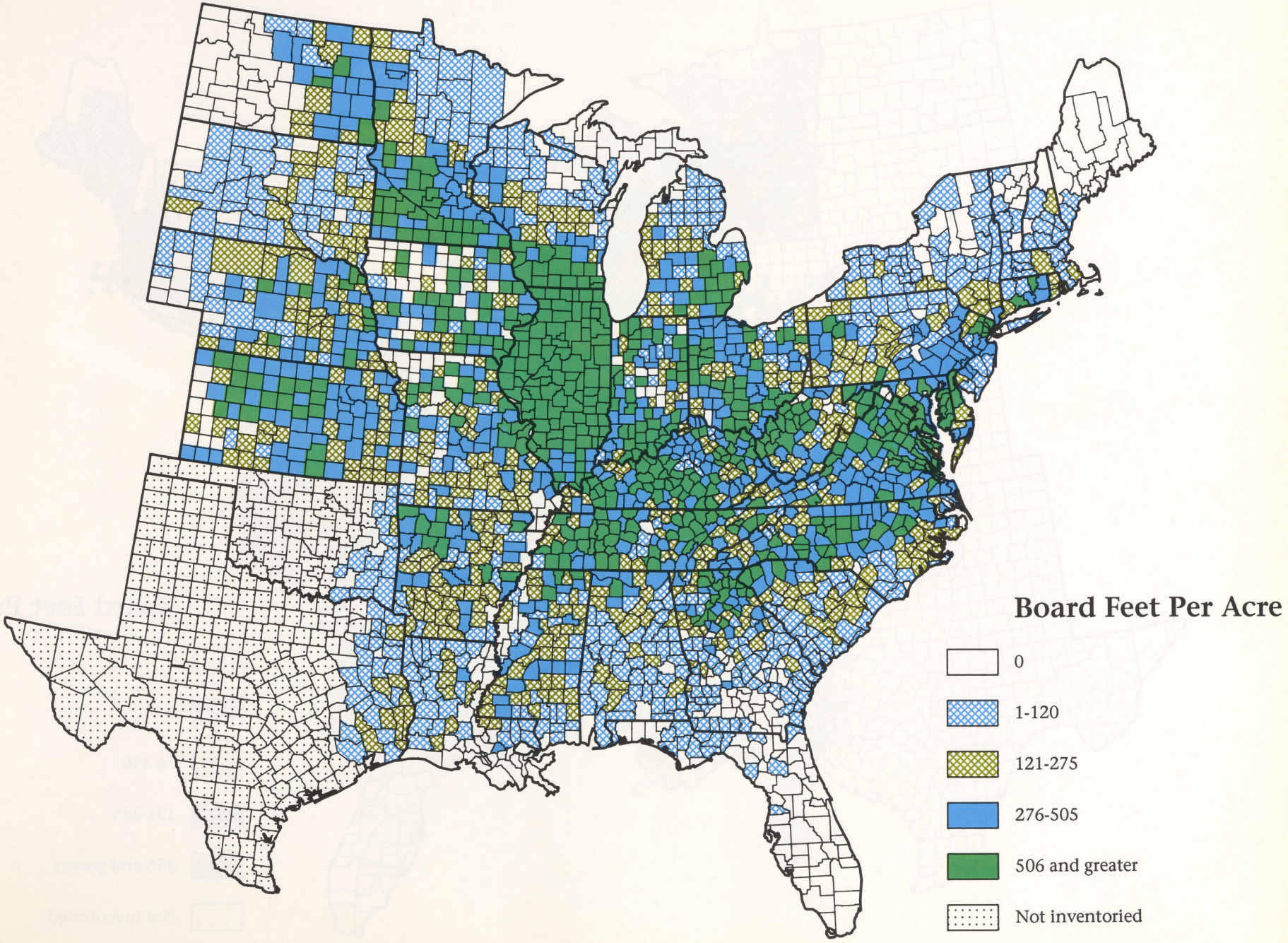


Figure 41 – **Select red oak board-foot volume.**

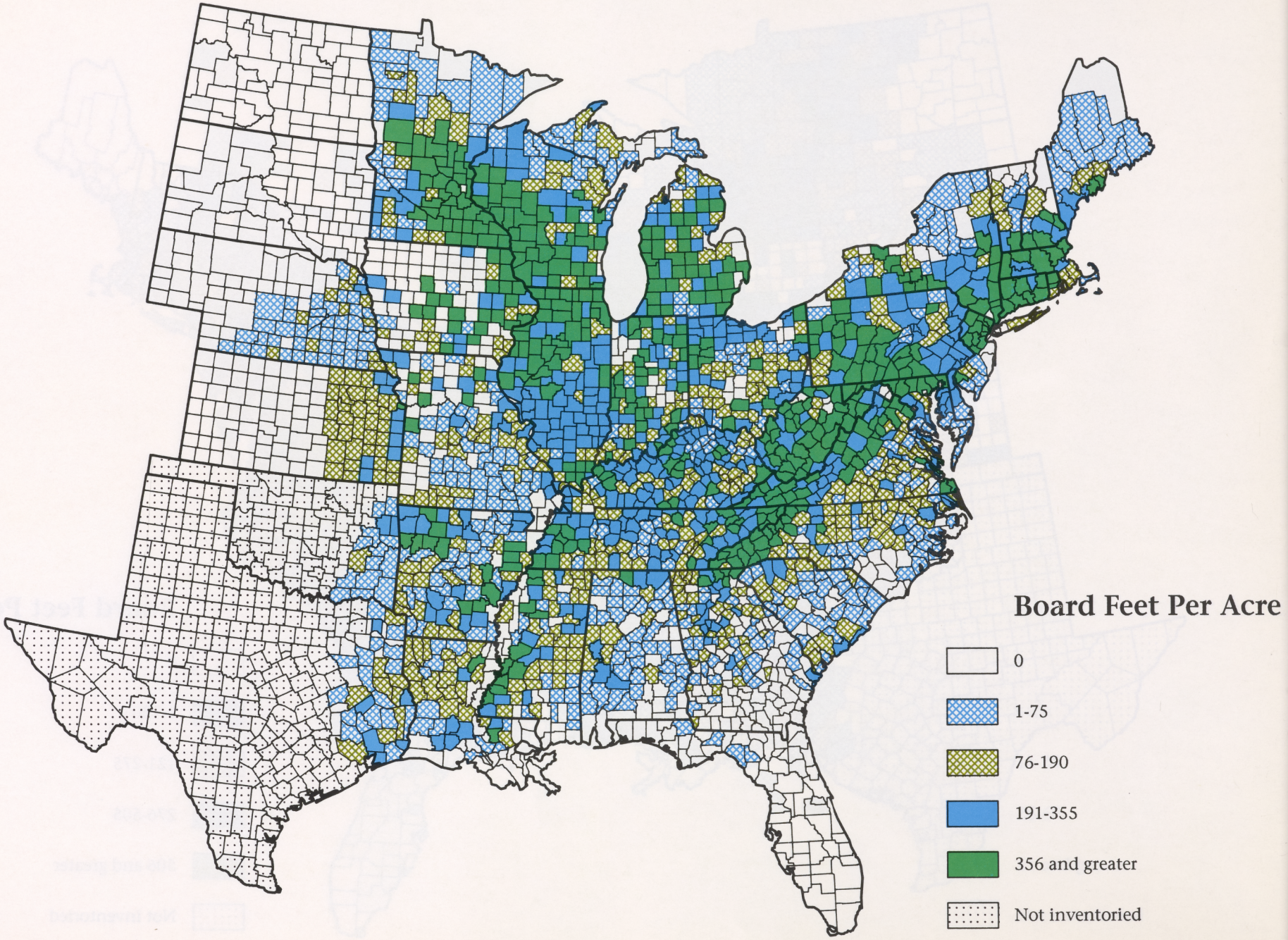


Figure 42 – **Other white oak board-foot volume.**

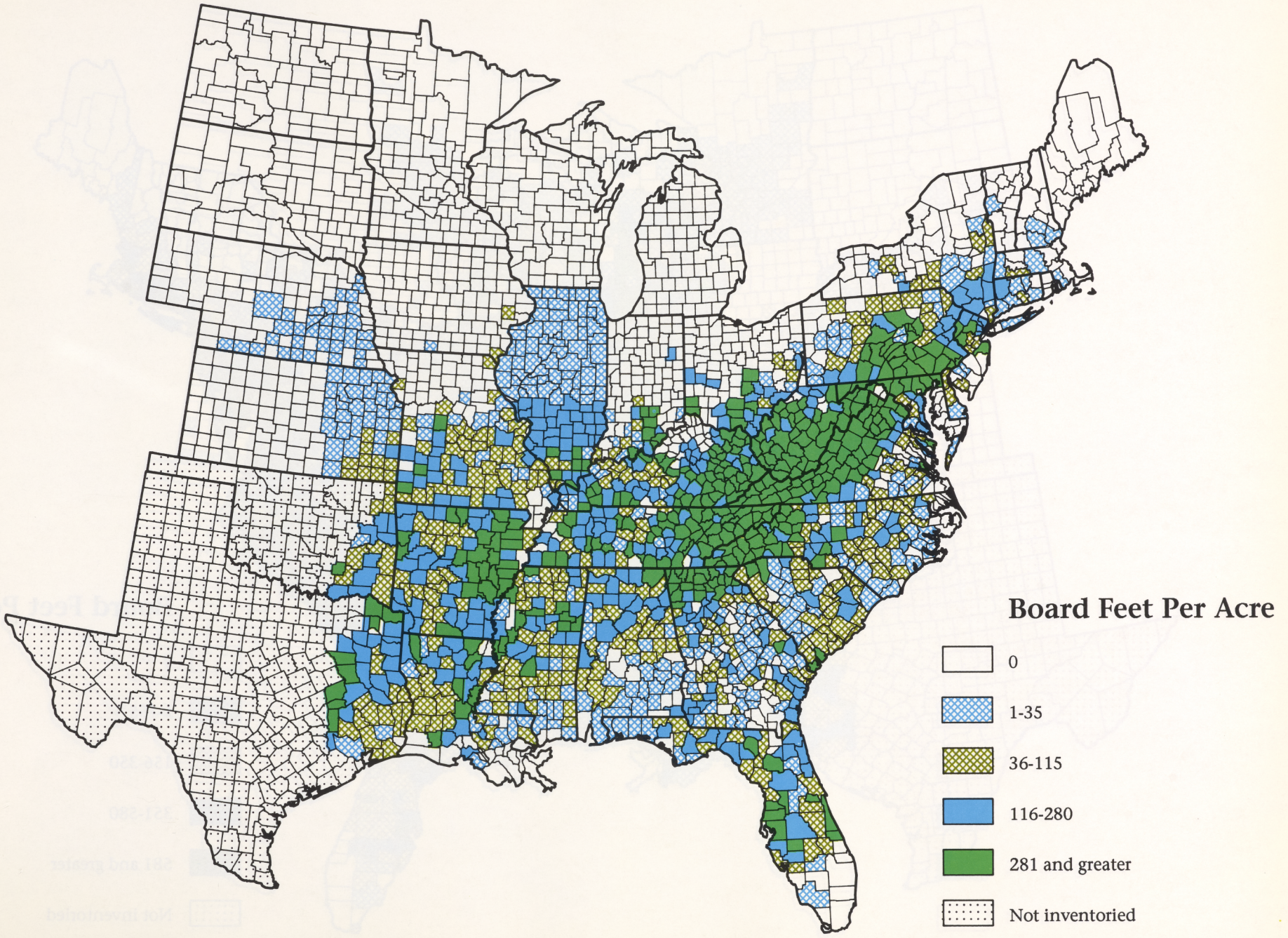


Figure 43 – **Other red oak board-foot volume.**

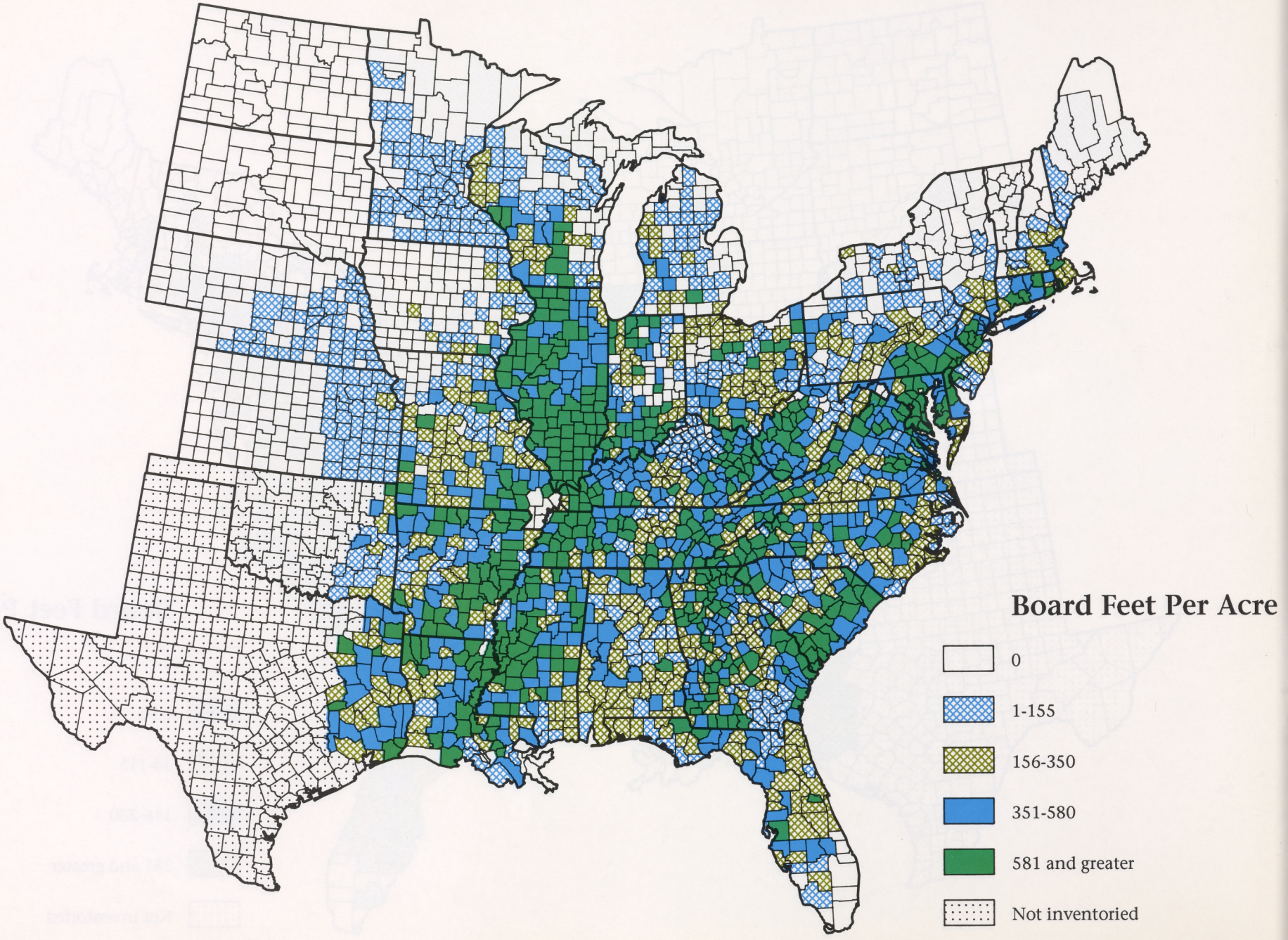


Figure 44 – **Hickory board-foot volume.**

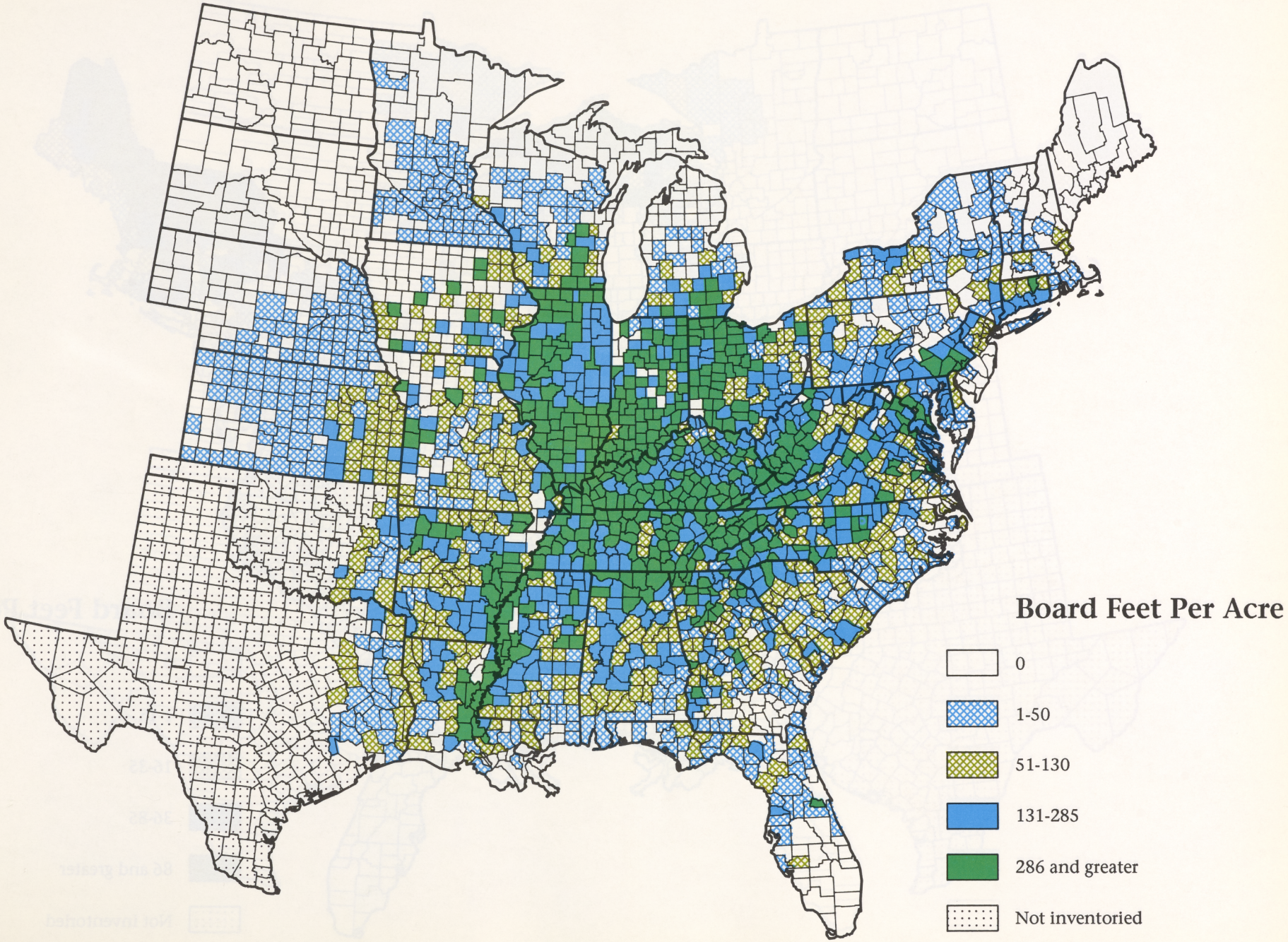


Figure 45 – **Yellow birch board-foot volume.**

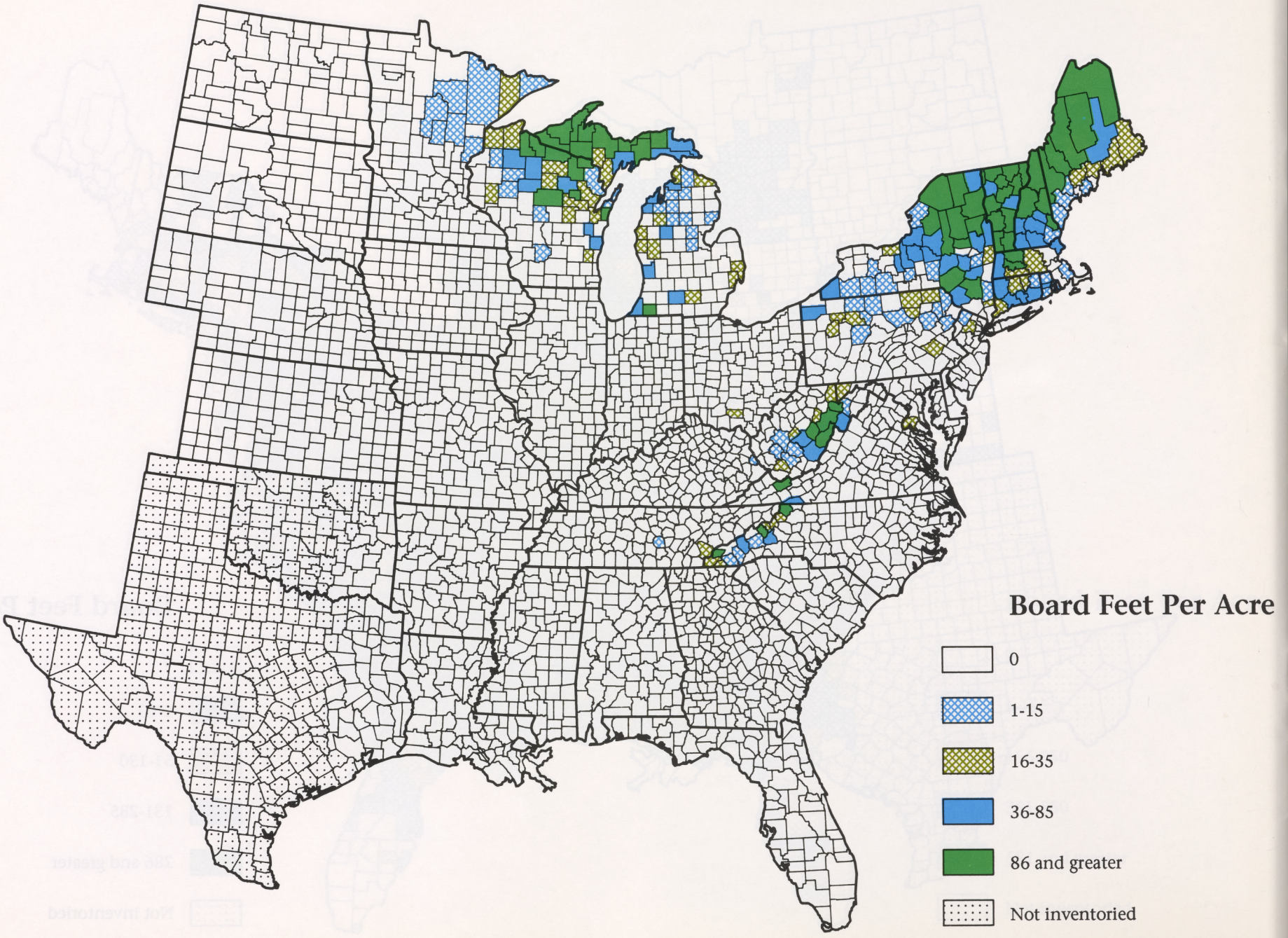


Figure 46 – **Hard maple board-foot volume.**

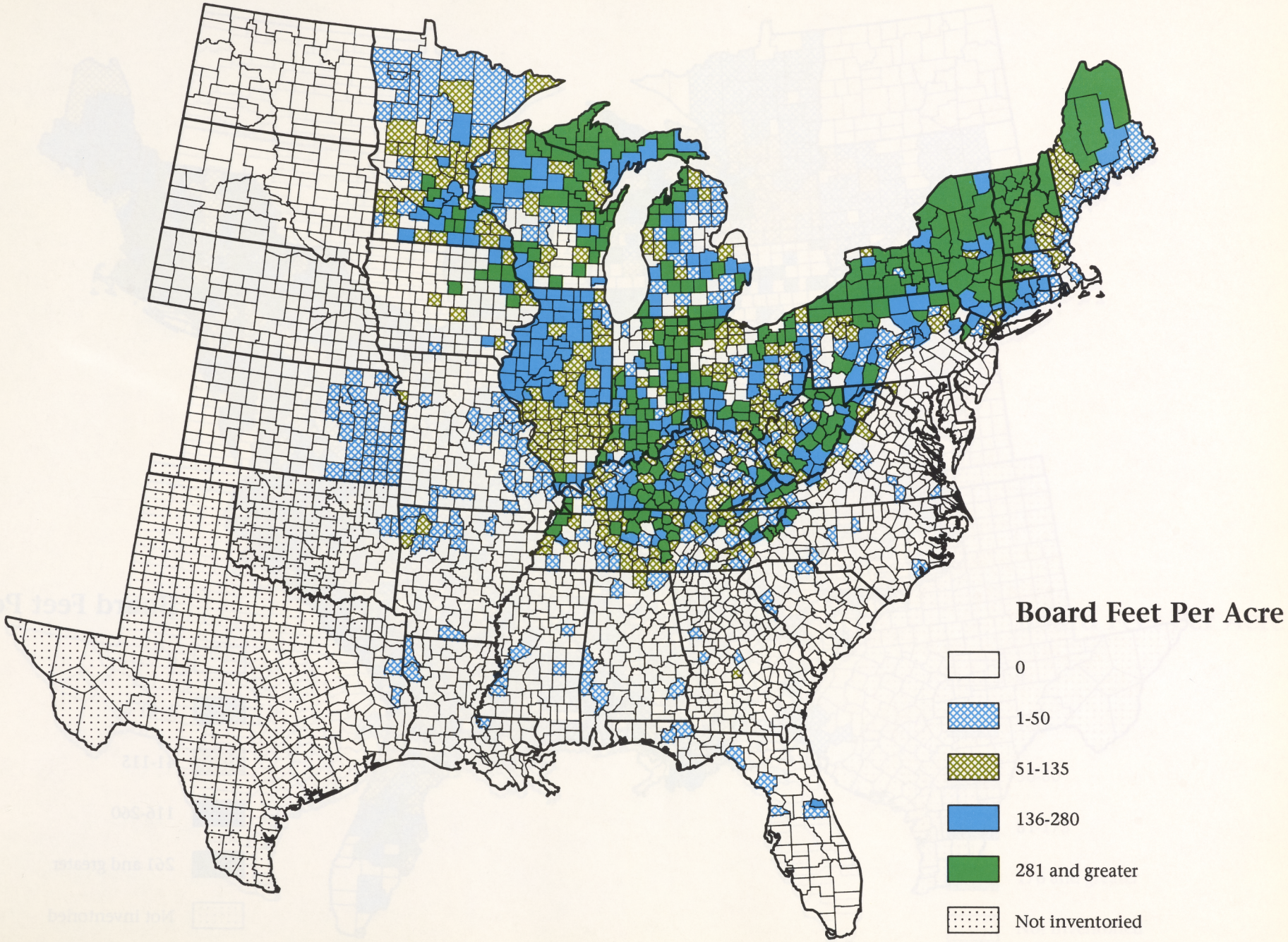


Figure 47 – **Soft maple board-foot volume.**

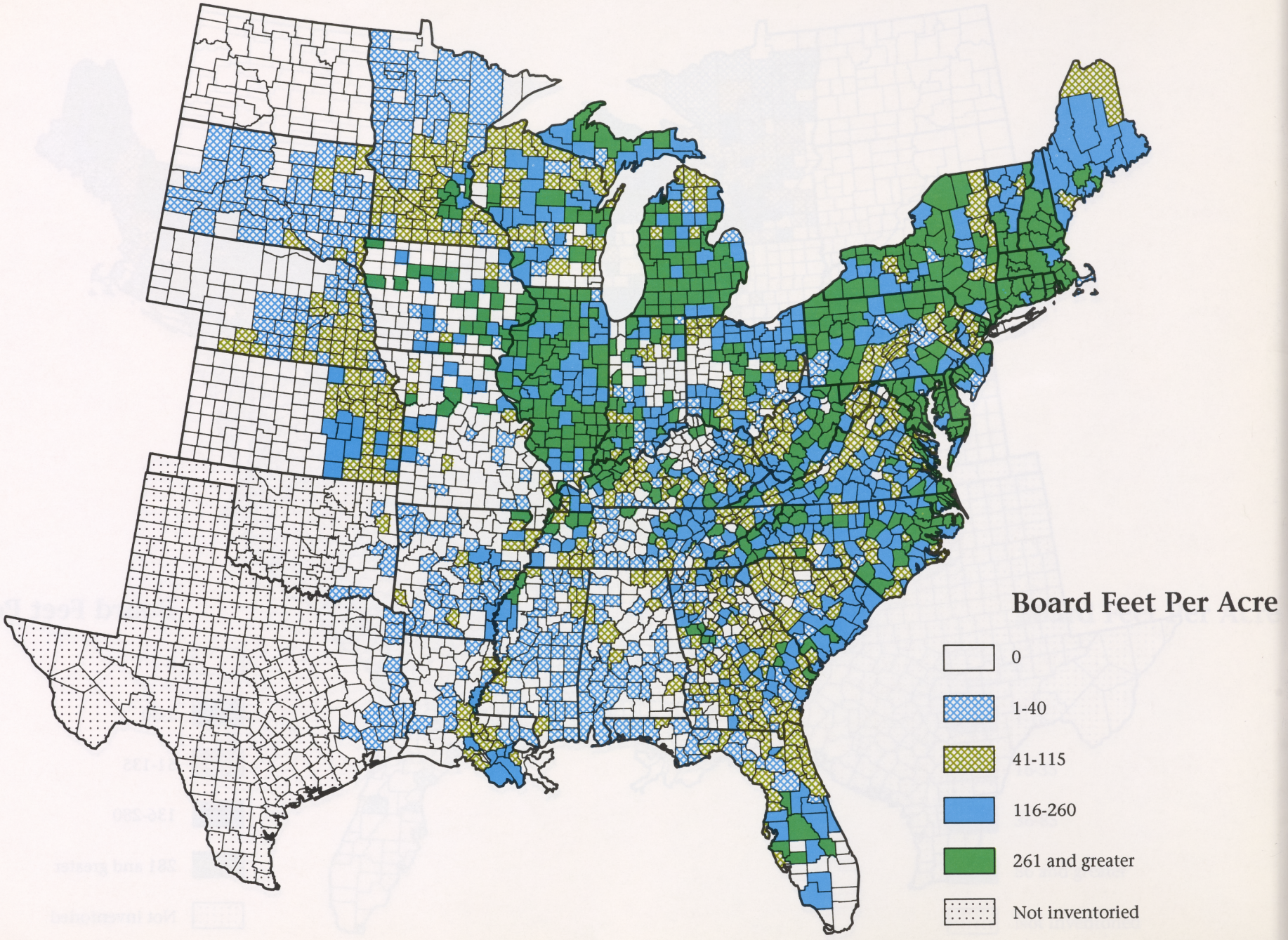


Figure 48 – **Beech board-foot volume.**

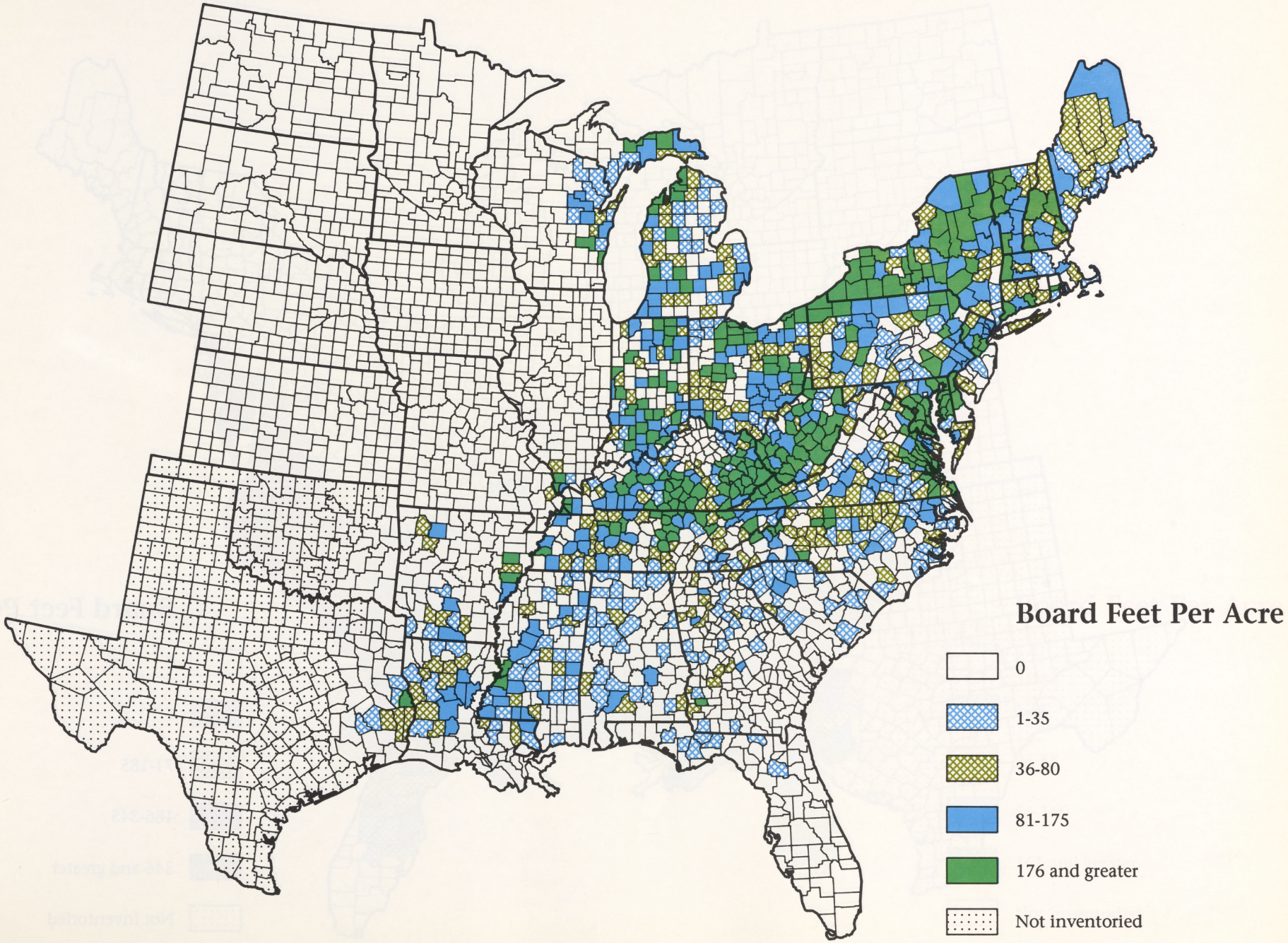


Figure 49 – **Sweetgum board-foot volume.**

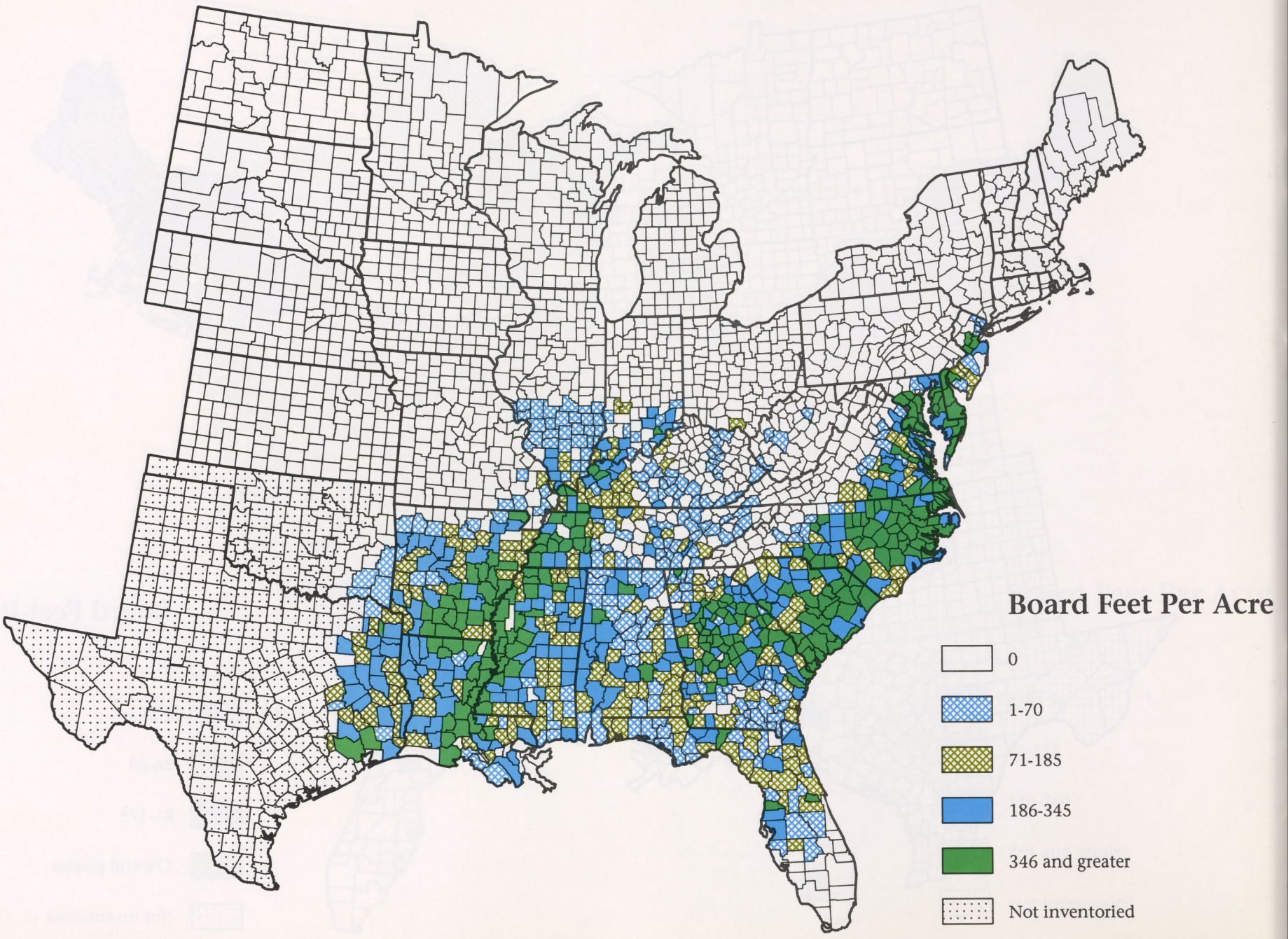


Figure 50 – **Tupelo and blackgum board-foot volume.**

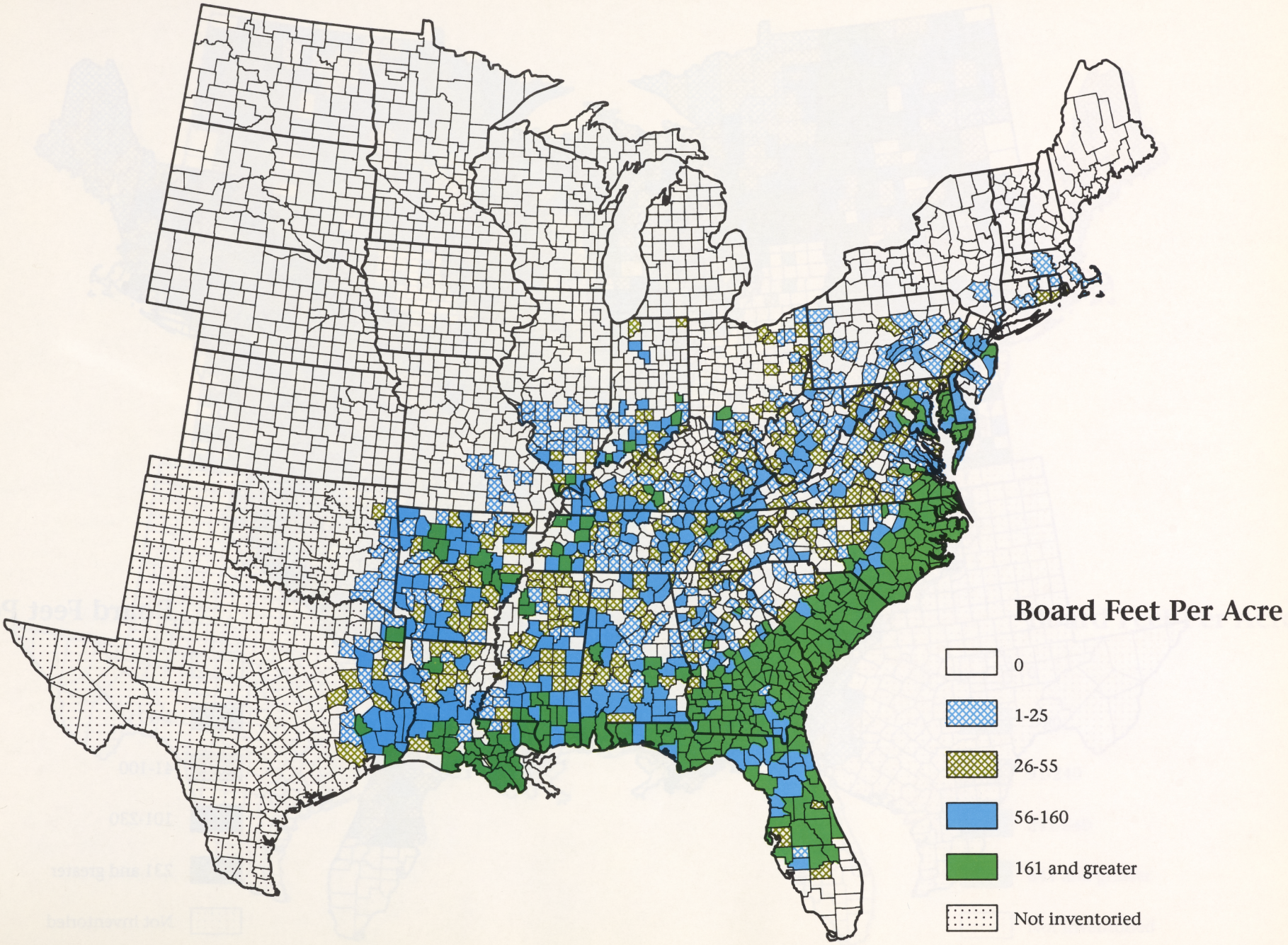


Figure 51 – **Ash board-foot volume.**

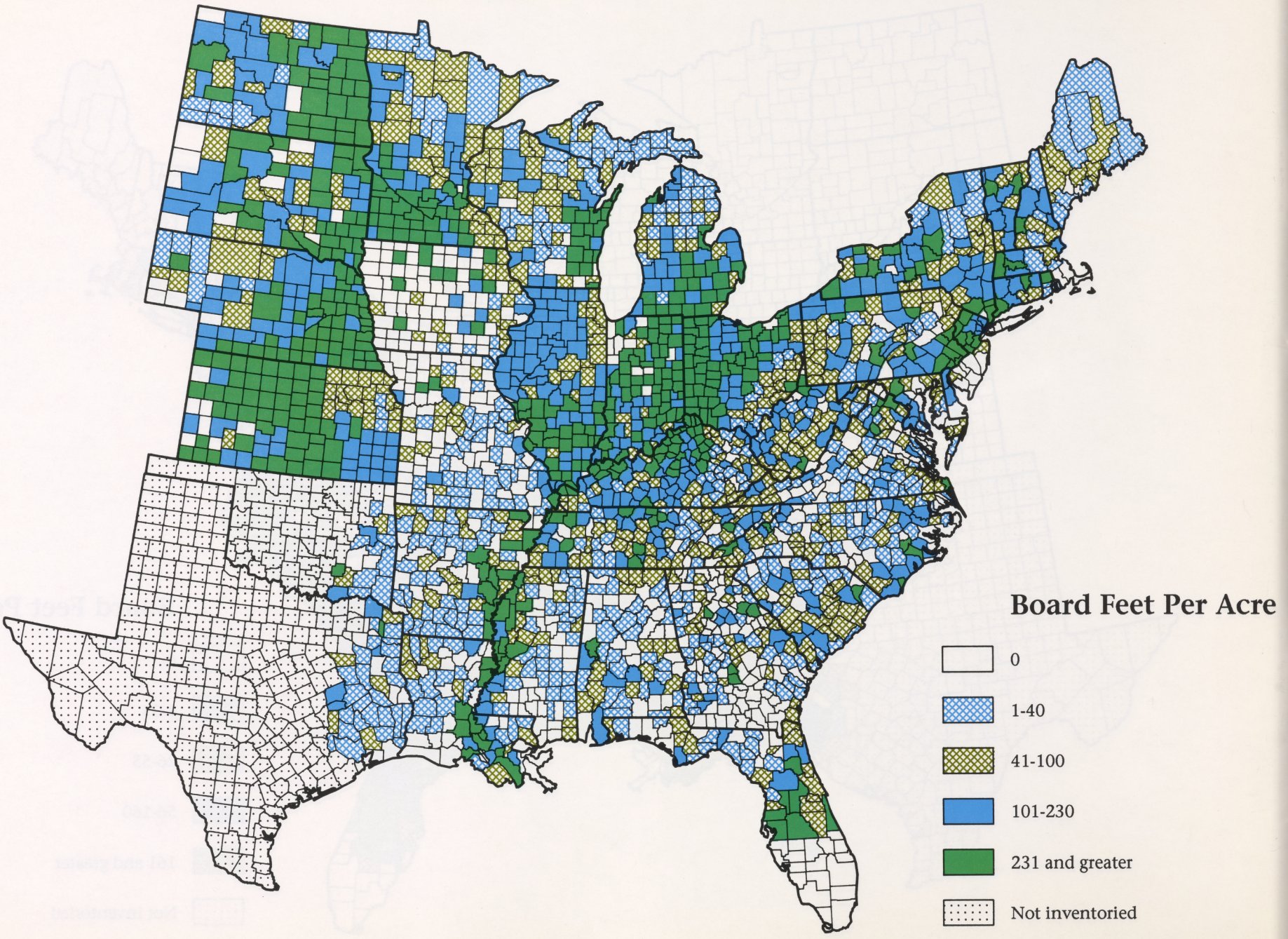


Figure 52 – **Cottonwood and aspen board-foot volume.**

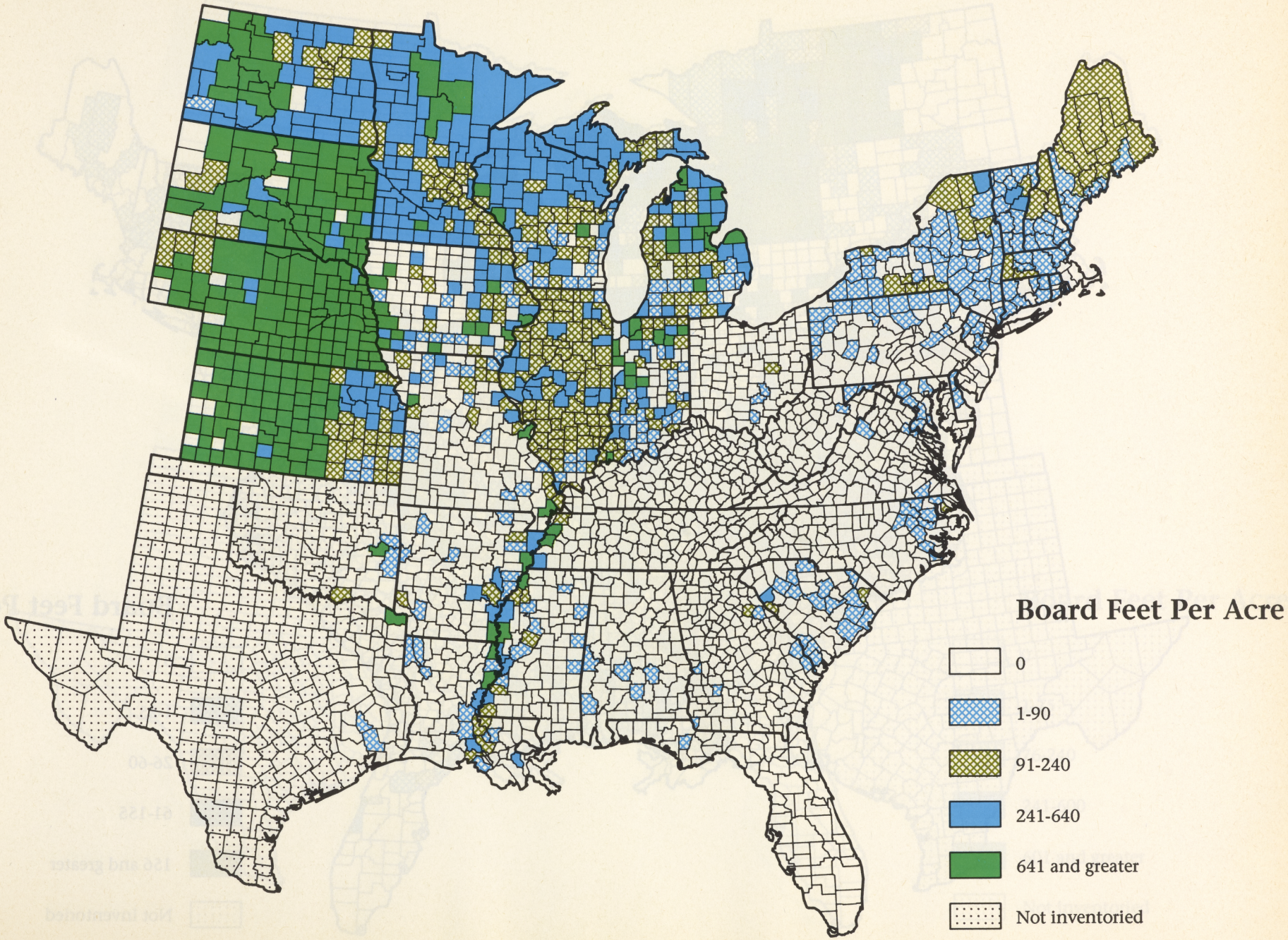


Figure 53 – **Basswood board-foot volume.**

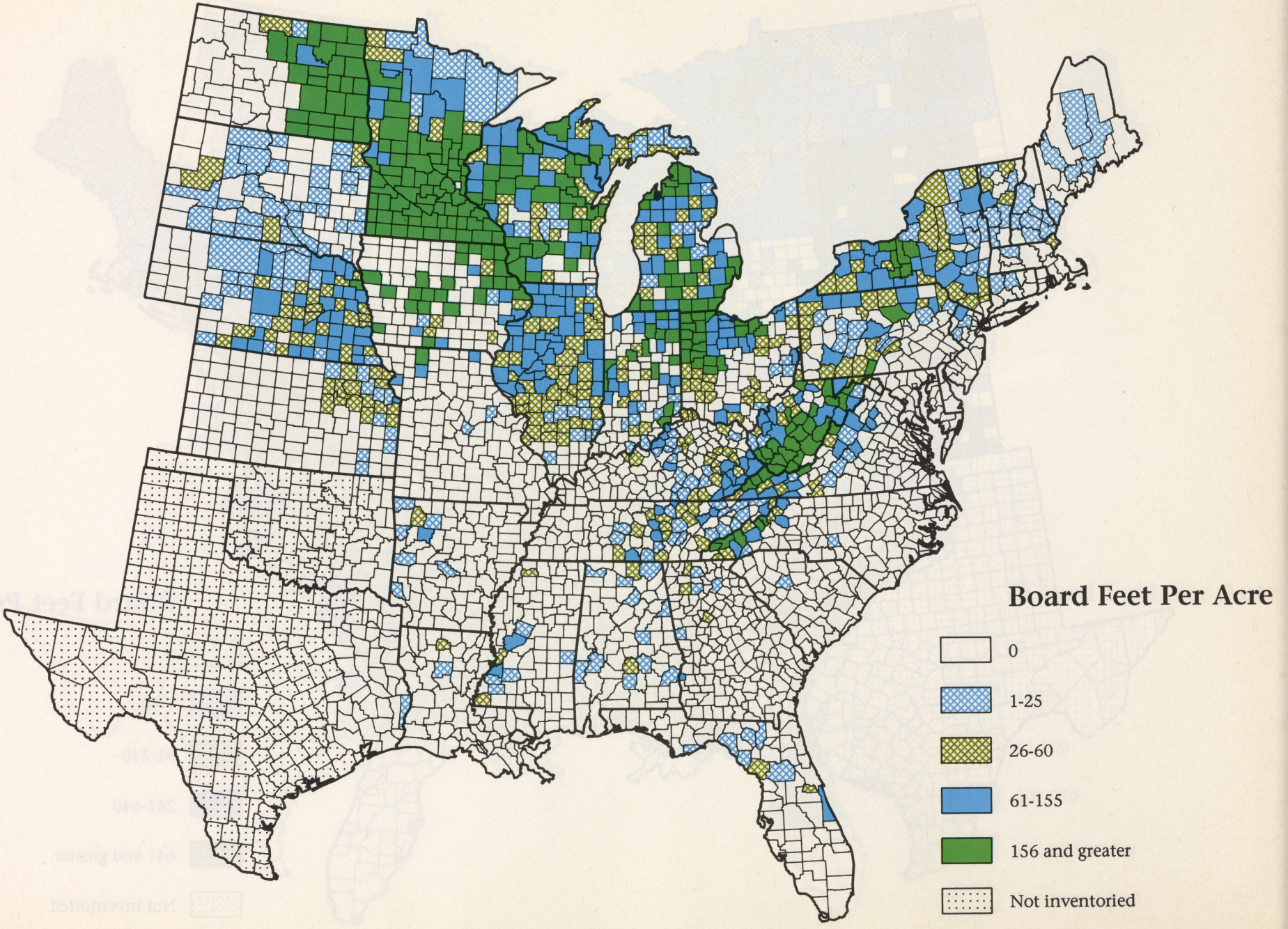


Figure 54 – **Yellow-poplar board-foot volume.**

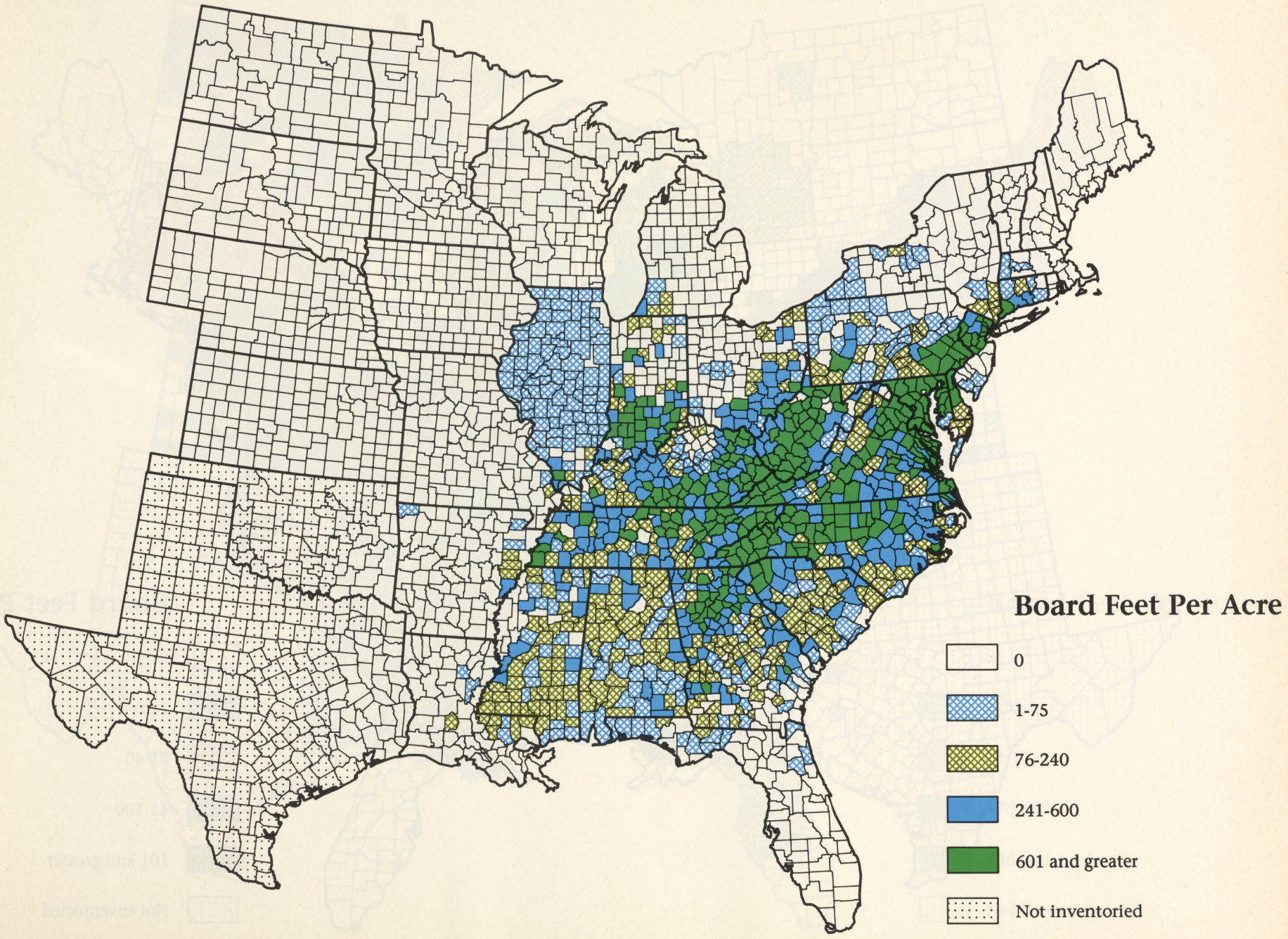


Figure 55 – **Black walnut board-foot volume.**

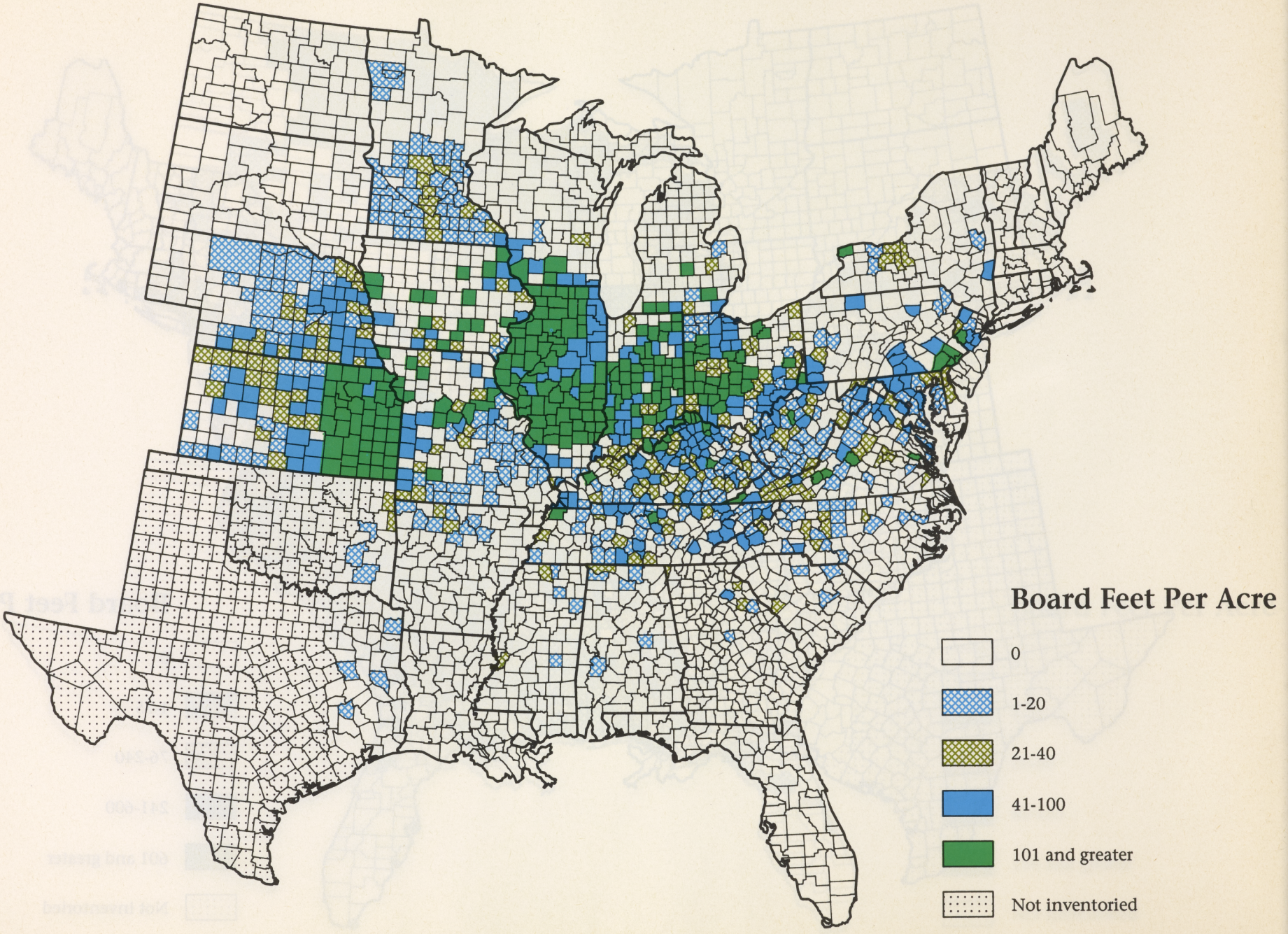


Figure 56 – **Other eastern hardwood board-foot volume.**

